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# An Investigation of the Comparative Efficiency of the MMPI and the TAT in Predicting Success in Nurses' Training

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# AN INVESTIGATION OF THE COMPARATIVE EFFICIENCY OF THE MMPI AND THE TAT IN PREDICTING SUCCESS IN NURSES' TRAINING

by

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## LIFE

Glenn Francis Williams was born in Cleveland, Ohio, April 26, 1924.

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# CHAPTER I

## THE PROBLEM

It has been said that the two most important decisions which a man makes are (1) what he shall be and (2) whom he shall marry. Undoubtedly a large amount of the happiness or unhappiness which a man experiences, both in this life and in the next, must be ascribed to the care with which he seeks answers to these questions. This study will be directed toward one aspect of the first of these questions.

The mere fact that a person wants to function in a certain occupation or profession does not of itself indicate that he has the proper qualifications. It is true that a person is usually more successful in an occupation towards which he feels some attraction than in one for which he has no attraction, but this attraction is not of itself predictive of success. In fact, there are many young people who ambition professional careers for which neither their intellectual endowments nor their education have prepared them. Thus, aspirants for any occupation must be selected by those who are responsible for maintaining the standards of the occupation and for insuring the welfare of the aspirants themselves.

Such officials regularly make use of various tests or meas-

ures of ability in formulating their decisions. A dockside hiring boss, for example, may select his men on the basis of some physical measurement, such as bicep width or chest expansion, whereas a school is usually more interested in indexes of a student's intelligence and his academic achievement.

Nursing schools share with other schools this interest in intelligence and academic achievement, but a nursing school is not exactly like other types of school. It is also a training ground and practice field for student nurses, men and women who are preparing themselves for a place on the medical team. The modern practice of the healing arts is essentially a team operation. For this reason the student nurse is reminded from the outset that the team is more important than any of its individual members and that the manner in which one functions on the team is more important than the type of function which one performs. Membership on such a team requires a level of personal adjustment and an ability to form wholesome interpersonal relationships quite beyond what is demanded in the ordinary school or college atmosphere.

It is not surprising, then, that nursing school administrators are interested in evaluating candidates on the basis of personal adjustment as well as intelligence and academic achievement. It will be shown in the next chapter that there has been a steady trend toward the use of personality instruments and away from the exclusive use of intelligence tests in selecting student nurses. That this trend has begun only rather recently is due in large

measure to the fact that reliable personality instruments were not previously available.

Subsequent chapters will detail a number of studies which have involved the administration of personality tests to female student nurses but few, if any, which have studied male student nurses. Male nurses, of course, are rather rare, and schools devoted exclusively to educating them are rarer still; in fact, there are only four such schools in the United States.

One of these schools, the focus of the present study, is located in a large midwestern city, where it has been educating secular and religious male nurses for more than twenty years. For most of that time the school's officials have enlisted the aid of a professional testing service, to screen applicants for the school and to recommend a given applicant's acceptance, deferral, or outright rejection. The selection process has been rigorous, at times nearly one-half of all applicants being rejected. Nevertheless, the officials of the school are interested in learning whether there is another test or tests which could be used in addition to their present battery—or even in place of it—which would enable them to screen out undesirable and unpromising candidates with greater success than they have been enjoying.

The importance of discovering such a test or tests seems obvious. When a young man leaves his home, perhaps in a rather distant city, or when he quits his job or leaves the military service, with attendant loss of seniority and perhaps of pension benefits,

or when he elects to attend a nursing school rather than a general college—all of these are important steps. Such a step consumes valuable time and makes it difficult for the man to resume an occupation which he has left, if he should withdraw from nurses' training or be found unsuited for it. From the standpoint of the nursing school, the costs of instructors' salaries, housing and maintenance of the students, and expenses for equipment and materials are considerable. They far exceed the small amount which the student himself pays toward his education and maintenance. Moreover, the student who is out of place is usually unhappy; in most instances the school is unhappy with him. His presence in the school often has the effect of lowering instructional standards, of weakening the morale of his fellow students, and of adding to his personal unhappiness. From every point of view it would have been better if such a student had been detected at the outset and told at that time to seek his livelihood and his happiness somewhere else.

A decision as momentous as this, however, ought to rest on reliable indexes of future success or failure. What sort of indexes should be used? Should they be tests of intelligence or of academic achievement or of personality—or of all three? The tests now used by this school seem to do an acceptable job of indicating a candidate's general level of intelligence and his previous achievement in certain key areas. The rough personality inventory included in the battery will detect gross personality prob-

lems. What seems to be missing is an accurate assessment of the candidate's attitude toward his work, his personal adjustment, and his ability to form adequate interpersonal relationships. Since these qualities form an important part of his personality, it is thought that they might well be used as an index of probable success in nurses' training.

In an effort to remedy the apparent deficiency in the school's present testing program and to provide evidence of the candidate's personal adjustment, two standard personality tests—the Minnesota Multiphasic Personality Inventory (MMPI) and the Thematic Apperception Test (TAT)—were administered to selected groups of student nurses. The precise rationale of the study and the reasons which prompted use of these particular tests will be given in subsequent chapters.

For now it remains only to state clearly the hypothesis under investigation, namely, that one or both of these tests will yield a more accurate prediction of success in nurses' training than is achieved by the present battery of tests. Stated as a null hypothesis, it reads as follows: Neither the MMPI nor the TAT is able satisfactorily to distinguish between successful and unsuccessful students in an all-male nurses' training program.

## CHAPTER II

## REVIEW OF THE LITERATURE: NURSING-SCHOOL SELECTION

During the first year of a nurse's training the school and the hospital with which it is connected make the greatest outlay and realize the smallest return from the contributed services of the students. Since 84% of the students who drop out of training do so during this first year (Fitzmaurice, 1949), it is evidently important to improve selection procedures. This is not a new need, for nursing schools have been trying to improve selectivity for the last 40 years. Many different tests have been tried in this effort, but to date none of them has been particularly successful.

Earlier tests almost without exception were intelligence tests, the reason being found in the history of the testing movement itself. Lewis M. Terman's 1916 revision of the Binet-Simon scales, which became known as the Stanford-Binet, was the first important American test. Within the next few years Robert M. Yerkes and his associates produced the Army Alpha and the Army Beta, and Arthur S. Otis published the first of his many group tests of intelligence. On into the 1930's intelligence tests were virtually the only tests available. Paper-and-pencil personality tests and projective techniques were developed later, followed still later by

aptitude tests and tests of specific abilities.

As tests of each sort have appeared, they have been studied for their potential value in improving nursing-school selectivity. Several of these studies are reviewed in this chapter.

Earl (1923) seems to have been one of the first to protest the excessive use of intelligence tests for nursing-school selection. "Intelligence testing cannot be made at this time to take the place of all other criteria. Where a student thoroughly satisfies from several standpoints, no test of intelligence should be used to her prejudice, for we cannot as yet measure zeal or enthusiasm nor fervor, and these qualities may loom large in a few people of only average intelligence."

Metcalf (1928), who had studied 331 student nurses with the Army Alpha, agreed with Earl's protest and asked for the development of tests "which will measure the total nursing ability of the individual." When she found that the Alpha correlated .83 with the students' ratings in theory but only .40 with their ward-practice evaluations, she concluded that "the Army Alpha does not measure the total nursing ability of the individual but merely gives an indication of the general intelligence of the candidate."

Hyman and Dreyfuss (1930) also objected to what they considered the over-emphasis on intelligence tests. Their study showed that "differences in intelligence above the minimum standard already assumed as a requisite for graduation from high school do not form an important factor in the qualifications for success in nurs-

ing," since they had found that "individuals considerably below the general adult norm in intelligence are not only capable of passing the nurses' training course, but that this is a quite usual occurrence." Such an occurrence, while perhaps "usual" in 1930 in the schools studied by these investigators, is quite unusual in 1963 in the school under present study, as in most American schools of nursing.

Habbe (1933) continued the attack on the use of intelligence tests as the sole criterion of selection, showing that, "provided the candidate has an IQ of at least 86, intelligence is not a statistically important factor in nursing training." When Rheinhart (1933) found that Stanford-Binet IQ's were not correlated with success in nurses' training, she concluded that the "IQ but little influences success in nursing, when that success is measured by grades in theoretical and practical work." She then shifted her attention to "psychological tests" and found that the American Council on Education Psychological Test (ACE) and the Moss Nursing Aptitude Test each correlated .62 with grades in nursing theory. This agreed with McPhail's (1929) earlier finding that the Brown University Psychological Examination correlated .76 with the academic grades earned by student nurses. However, an attempted replication of McPhail's study achieved a correlation of only .60 (McPhail & Bernard, 1943).

The tests used by Rheinhart, McPhail, and others were frequently called "psychological tests," but they were not nearly so

psychological nor so different from the usual intelligence tests as are the paper-and-pencil personality tests and especially the projective techniques in use today. Nevertheless, their use in the selection procedures of the 1930's marked the start of a trend which quickened during the next decades.

O'Connor (1936) used a four-part test, involving vocabulary, wiggly-block, free association, and pin board. He found that the vocabulary test was a good predictor of classroom success and that the wiggly-block was satisfactory as a predictor of success in ward practice, but that the other tests were not indicative of success in either area. In view of the findings of Terman, Wechsler, and others, that the best single indicator of intelligence is accurate use of vocabulary, this study of O'Connor's seems to emphasize the point that intelligence tests are not to be ignored in selecting student nurses, but that they are not to be used exclusively. Most later investigators have acknowledged the importance of both intelligence and personality factors for success in nurses' training, ascribing relatively more importance now to one, now to the other.

For instance, Brooks (1937) reported that "students of greater mental ability, generally speaking, do better in both theory and practice than do those of lesser ability, the difference between the two groups being greater in the case of theory. Students of greater maturity, on the other hand, do better in both theory and practice than do those who are immature, the difference between the

two groups being greater in the case of ward practice." She based these conclusions on her finding that the ACE correlated .54 with classroom grades, while the Willoughby Test of Emotional Maturity correlated .50 with ward-rating scales. She suggested that "psychological tests can be used to best advantage in elimination and prediction when they are employed in conjunction with a well-planned selective preliminary period, with careful supervision, and with a program of guidance."

Douglass and Merrill (1942) reported that eventual success in nurses' training is correlated more highly with ratings submitted by high-school principals than with any other index, especially when the student has attended a small high school, in which presumably the principal has an opportunity to know the students personally. This finding seems to indicate that there is no substitute for close personal knowledge of a canidate for whom one is asked to submit an evaluation. Since close personal knowledge is not always possible, however, personality inventories are in demand.

Crider (1943) challenged the usefulness of such inventories, contending that the Strong Vocational Interest Blank (VIB) and the Bell Adjustment Inventory "contributed very little" to her results, whereas the Otis Self-Administering (S-A) Test of Mental Ability and some tests of reading and arithmetic ability "were able to discriminate between good and bad risks in nursing school."

Also ranged against personality inventories was Potts (1945) who tested "several thousand" applicants for nurses' training,

using tests of scholastic aptitude, general vocabulary, non-technical scientific vocabulary, reading comprehension, reading speed, science information, arithmetic, mechanical abilities, and personality. She reported that scholastic aptitude correlated .41 with grade-point averages and that other tests of academic skill and achievement were worthwhile indexes of eventual success in the nursing program. The test of mechanical abilities was of less predictive worth and the personality test least important of all, except in a few instances in which an extreme personality deviation was indicated. "There seems to be," she concluded, "no such thing as a nursing personality pattern." This conclusion, however, has been seriously challenged by later investigators.

Sartain (1946) found that the Potts-Bennett tests correlated .70 with high-school grade-point averages and .68 with nursing-school grade-point averages. His study thus showed that the high-school grade-point average is itself a good predictor of performance in nursing school and seems to deserve more attention than it has received.

Gunnell and Nutting (1957) also investigated the validity of predictions made on the basis of high-school grade-point averages and reported that these correlated .51 with final grade-point averages in nursing school, whereas the Otis S-A Test correlated only .42 with the same final averages. Garrett (1960) reported that a combination of high-school grade-point averages with test scores in arithmetic, silent reading, and clerical aptitude correlated

.64 with success in nursing school.

Berg's (1947) study showed that almost one-half of the students who failed to complete nurses' training could have been detected at the very beginning of the course by means of the scholastic and nursing aptitude tests which he had administered to them. The tests he used were the ACE and the George Washington University—Hunt series of nursing aptitude tests.

Fitzmaurice (1949) compared the individual tests of this series with nursing-school averages and reported correlations ranging from .40 to .54. However, the entire battery yielded a multiple correlation of .80 with these same averages. The conclusions of Fitzmaurice's study are so apposite that they deserve to be quoted at length. He found (1) that the primary reason for elimination from nursing school is academic failure; (2) that the preclinical period is the most crucial stage of training; (3) that intelligence test scores bear directly on success in nursing school; (4) that high-school averages and percentile ranks are of definite value as indexes of probable success in the nursing curriculum; (5) that students who do exceptionally well in entrance examinations tend to do equally well within their nursing-school classes in theoretical work; and (6) that nursing aptitude tests are at least as valuable as other psychological tests in the task of predicting success in nursing schools.

Healy and Borg (1952) found that students who eventually dropped out of nurses' training tended to accumulate poor scores on

the Guilford-Martin scales, which measure nervousness, depression, cycloid tendencies, objectivity, and cooperativeness. Since these scales bear at least a surface resemblance to the clinical scales of the MMPI, which will be described in the next chapter, it will be interesting to keep this finding in mind when discussing the results of the present study.

Lough (1946) filed a negative evaluation of the usefulness of the MMPI for nursing-school selection. She found no significant differences between the mean scores of any of her groups and concluded from this that the MMPI was not helpful. Weisgerber's (1951) results were similar to Lough's, showing, as he contends, "the impossibility of determining typical profiles which will serve to distinguish with any reliability the better prospects from the poorer. . . . The MMPI cannot safely be used for predictive purposes with a group [of female student nurses] like the one studied, though it may perhaps be used for personal guidance."

Finally, Haney's (1960) group experimented with both cognitive and non-cognitive predictors of achievement in nursing school and reported that only the cognitive-type measures showed predictive validity.

These studies seem to caution that one should walk a judicious middle path between overemphasis on intelligence tests and overenthusiasm for personality tests.

Since a nursing school is primarily a school, it is not surprising that indexes of intelligence and academic achievement are

of considerable importance in the selection of candidates for such a school. But a nursing school is not entirely like other schools. While theory is important and receives considerable emphasis, there is also a large amount of practical work to be done. This work requires a certain measure of mechanical ability and a large capacity for understanding people and cooperating with them. The student with undesirable personality characteristics who might be able to pursue a strictly academic course without any major difficulty would be out of place in the essentially cooperative atmosphere of the operating theater or the emergency room.

It is felt that an adequate program of selection should detect such a person even before the course in nurses' training is begun and thus save both the individual and the school from needless waste. In an effort to find new tools with which to make this selection, a paper-and-pencil personality test and a projective technique—the MMPI and the TAT—were used in this study. Earlier studies of these two tests are reviewed in the next two chapters.

# CHAPTER III

## REVIEW OF THE LITERATURE: THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

The Minnesota Multiphasic Personality Inventory (MMPI) was constructed by Starke R. Hathaway and J. Charnley McKinley and published by the University of Minnesota Press in 1940. The first official manual of the test appeared in 1943 and was revised in 1951. In its original (1940) format the test consisted of 550 cards, on each of which was printed a statement which the subject was to evaluate as generally true of himself or generally not true of himself or "cannot say." The 1943 version of the test substituted paper-and-pencil, with optional IBM scoring, for the card-sorting technique. This version contains 566 items, because 16 items had to be repeated for ease of machine scoring. The subject blackens the T(rue) square, if the item is generally true of himself; he blackens the F(alse) square, if the item is generally not true of himself; and he leaves both squares blank, if he "cannot say."

The items of the test were selected from several psychiatric direction forms, from various textbooks of psychiatry, from directions for case taking in medicine and neurology, and from several earlier published scales of personal and social attitudes (Hathaway & McKinley, 1940). Once assembled, these items were adminis-

tered to groups of previously diagnosed inmates of the University of Minnesota Hospital and to a comparable-sized group of "normals," most of whom were visitors to the hospital. The clinical scales of the test consist of those items which differentiated the normal group from each of the several clinical groups. The scales were named according to the primary diagnosis of each of these clinical groups (Hathaway & McKinley, 1943).

Investigations of the diagnostic validity of the clinical scales have regularly shown that it is erroneous to attach a Kraepelinian label to a subject simply because his MMPI profile contains an extreme T score on some particular scale. The test authors themselves advise against literal interpretation of the scales and have recently suggested that numbers be substituted for the original Kraepelinian labels in order to emphasize the point. Experience has indicated, however, that the more scores that are elevated and the higher these elevations, the more likelihood that the subject is severely disturbed (Hathaway & McKinley, 1951).

In addition to the clinical scales there are four validity scales, which indicate how accurately a subject's responses reflect his true attitudes and usual ways of acting and how much credence, therefore, is to be placed in the results. There follows a brief description of each of these scales.

"?" or "cannot say" scale: The height of this scale obviously affects the magnitude and therefore the significance of the other scales. It is in its own

right an indicator of personality, but no specific clinical material on it has been analyzed. High scores have often been observed to occur in psychasthenic and retarded depression patients.

L scale is a short scale of 15 easily scorable items, each of which refers to some act or attitude which is generally judged to be socially unacceptable, but such a mild offense that virtually everyone is guilty of it at some time or other and most people are not embarrassed to admit that they themselves have on occasion succumbed. The theory is that a subject who would never admit to any of these faults is attempting to falsify his score by choosing always the response which puts him in the most acceptable light socially.

F scale consists of 64 items, all but one of which was answered in the scored direction by no more than 10% of the normative group. While serving as a check on the validity of the whole record, a high F score, especially when coupled with a low K score, can be indicative of a tendency to "fake bad."

K scale was not part of the original test but was added in 1946, in order to sharpen the discriminatory power of the clinical scales. It is a measure of test-taking attitudes, appearing either as personal defensiveness or as an exhibition of personal defects and troubles.

Hs scale measures a person's concern with bodily functions. Those who show high scores on this scale are usually unduly worried about their health. The hypochondriac is also characteristically immature in his approach to adult problems; he tends to fail to respond with adequate insight. He differs from the hysteric by being more vague in describing his complaints and by not seeming to use his complaint to escape from an unacceptable situation, as the hysteric frequently does. Real organic illness does not raise a person's score on this scale, for the scale is designed precisely to detect the difference between the organically ill and the hypochondriac.

D scale measures the depth of clinical depression in the subject. This mood state is characterized generally by pessimism of outlook on life and the future, by feelings of hopelessness and worthlessness, by slowing of thought and action, and frequently by preoccupation with death and suicide. A high score on this scale further suggests a lack of self-confidence, a tendency to worry, narrowness of interests, and introversion.

Hy scale measures the conversion-type neurotic reaction. Those who score high on this scale appear to use physical symptoms as a means of solving difficult conflicts or avoiding mature responsibilities. They are in general psychologically more immature than high scorers in any other group.

Pd scale measures the absence of deep emotional response, inability to profit from experience, and disregard of social mores. Those who score high on this scale are frequently likable and intelligent, but they show repeated and flagrant disregard for social customs, the inability to profit from punishment, and emotional shallowness in relation to others, particularly in sexual and affectional display. The most frequent deviations perpetrated by such persons are lying, stealing, alcohol or drug addiction, and sexual immorality. Such persons may have short periods of true psychopathic excitement or depression, if their antisocial actions are discovered.

Mf scale was originally constructed to identify the personality features related to male sexual inversion. Persons with this pattern often engage in homoerotic practices as part of their feminine emotional makeup; however, many of these men are too inhibited or full of conflicts to make any overt expression of their sexual preferences. Their feminism appears in their values, attitudes, and interests, in their style of expression and speech, as well as in their sexual relationships. Homosexual abnormality is not to be assumed on the basis of a high score on this scale without independent confirmatory evidence. This scale

has been found of importance in vocational choice.

Pa scale measures suspiciousness, oversensitivity, and delusions of persecution, with or without expansive egoism. Some persons who are actually paranoid are clever enough to avoid betraying themselves by their answers to the items of this scale.

Pt scale measures obsessive ruminations, compulsive behavior rituals, abnormal fears, worries, difficulties in concentration, guilt feelings, and excessive vacillation in making decisions. Other features include excessively high standards of morality or intellectual performance, self-critical and self-debasing feelings and attitudes, and the assumption of a remote and unemotional aloofness from some personal conflicts.

Sc scale is closely related with the Pt scale but more discriminatory than that scale in the detection of true schizophrenics. These are persons characterized by constrained, cold, apathetic or indifferent behavior, delusions, hallucinations, general disorientation, complete inactivity or endless stereotypy. Such persons are frequently of good intelligence but perform below the levels expected of them.

Ma scale measures those characterized by overproductivity in thought and action. Many of the scorable items are merely accentuations of normal responses. This type of person is active and enthusiastic and may have gotten into trouble because of undertaking too many things. Because activity in the wrong places or at the wrong times can result in conflict with the law, many of those who score high on this scale are also found to have scored high on the Pd scale.

Si scale, constructed in 1946, is useful in detecting the person who suffers from a variety of special sensitivities, insecurities, and worries, but is relatively free from mental aberration (Hathaway & Meehl, 1951; Dahlstrom & Welsh, 1960).

For each response made in the scorable direction the subject

receives a raw score of one on the corresponding validity or clinical scale. The total raw score for each scale is converted into a standard or T score, according to the following formula:

$$T = 50 + \frac{10(X-M)}{SD}$$

where X is the subject's raw score on a particular scale, and M and SD are the mean and standard deviation, respectively, of the raw scores for the Minnesota normative group. Since the addition of the K scale in 1946 (Meehl & Hathaway, 1946), the procedure suggested by the test authors calls for adding the K score or decimal fractions of it to some of the clinical-scale raw scores before these are converted into T scores. Profile sheets are available on which raw scores can be recorded, K values added where appropriate, and the T scores read directly, without doing the computation involved in the equation given above.

By 1953 more than 283 studies of the MMPI had been published, and the stream of articles has diminished only slightly in recent years. Since it is obviously impossible within the confines of this paper to review more than a few of these studies, only those are cited which bear most directly upon the topic of nursing-school selection procedures.

Male nursing-school candidates are similar to male college candidates in most respects, including age, educational background, marital status, and military draft status. Hence, if there is an MMPI response pattern which is characteristic of college males, it

should be considered in interpreting the results of this study.

Bier (1948) found just such a characteristic, reporting that "college-level groups have characteristic profiles on the MMPI, tending to score on the average nearly half a standard deviation above the mean of the general population." Brown (1948) reported that college groups differ from the MMPI normative group enough to make one "at least very cautious" in comparing the two groups. Clark (1954) went further, maintaining that college students differ so significantly from the MMPI normative groups as to render imperative the construction of new collegiate norms. Goodstein (1954) found that the MMPI profiles of college males differ significantly, not only from those of non-collegiate males, but also from those of college females. For this reason he advocated the construction of double sets of norms for each sex, with provision for collegiate and non-collegiate status. He denied, though, the earlier contention of Sopchak (1952), that the profiles of college males are characteristic of the geographical location of their college.

General agreement that the MMPI is in need of special collegiate norms does not indicate, however, that this test predicts academic achievement. That is a separate question which has to be separately investigated.

Drake and Oetting (1957) asserted that the MMPI can be used to predict academic performance, but most other authors have preferred to adhere more closely to the clinical rationale of the test and to use it as an index of personal adjustment. Academic success is of-

ten facilitated by adequate personal adjustment, and academic failure, conversely, is often ascribable in large measure to personal maladjustment. But in both instances the MMPI T scores seem to indicate directly the degree of adjustment or maladjustment and only indirectly to predict success or failure.

Many investigators and the test authors themselves have warned that MMPI profiles should be judged in terms of patterns, not by the height of a single scale or pair of scales taken alone. Nevertheless, studies continue to appear in which attention is called to one or other particular scale. Since some of these studies are relevant to the present topic, they deserve to be cited.

Brower (1947) obtained a negative correlation between IQ and scores on the Hy, Hs, and Pd scales and concluded that "intelligence seems to function as a limiting value in the elaboration of symptoms and the expression of maladjustment." Altus (1948) reported that the Ma scale distinguished academic achievers from non-achievers at the .01 level of confidence, with the non-achievers consistently scoring significantly higher than the achievers. Wexner (1954), on the other hand, found that it was the Pa scale which was significantly correlated with intelligence, as measured by the Otis S-A Test. In support of this conclusion, Anderson (1956) reported that college students with low Pa scores encounter more difficulties and show less academic achievement than those with high Pa scores.

Yeomans and Lundin (1957) found that the Pd, Mf, and Ma scales were most discriminative in college populations, with the better students scoring higher on the Mf scale and the poorer students scoring higher on the Pd and Ma scales. This report agrees substantially with Drake and Oetting's (1957) report that students who lack academic motivation show the following MMPI pattern: Sc and Ma are among such a student's three highest scales; Mf is not one of the three highest scales; and Si is one of his two lowest scales.

These studies serve as a reminder that scales are not to be interpreted literally, especially not according to the Kraepelinian names which they bear. High scores on Mf and Pa, therefore, do not necessarily point to effeminate or paranoid tendencies; in fact, among college-level males they may even predict academic success.

Tydlaska and Mengel (1953) developed a special scale for measuring one's attitude towards his work. A later study (Tesseneer & Tydlaska, 1956) reported that this scale successfully distinguished college students who had been rated by their teachers according to their scholastic attitude. This is but one of the more than 213 additional scales which have been devised, using the items of the MMPI. Several of these scales were used in the present study, as is explained in subsequent chapters.

There are also a number of studies in which the MMPI was used to predict success or failure in some particular occupation or vocation. Harmon and Wiener (1945) were among the first to set such

a task for the MMPI, and they were enthusiastic about the results. "The MMPI," they reported, "is able to delineate personality characteristics of crucial importance in the actual choice of vocation and has yielded valuable information to aid in the prognosis of success."

In 1948 Bier published his comparative study of the MMPI records of seminarians, pre-professional college students, and general college students, one result of which has been an extensive use of the MMPI throughout the United States in the selection of seminarians and candidates for the religious life. His suggestion, however, that a shorter and somewhat emended version of the test be used in place of the original version has been found unnecessary (Rice, 1958) and also undesirable, since it has the effect of separating all this testing from the mainstream of MMPI research.

Benko and Nuttin (1956) reported from France a study in which the MMPI was used to predict the success of candidates for the priesthood. The follow-up study two years later seemed to indicate that the original findings were accurate. Webb and Goodling (1958) obtained correlations ranging from .09 to .44 between MMPI T scores and the "successful adjustment" of Methodist divinity students. Their experimental design, however, involved the use of so many different tests and evaluation of the students according to so many different criteria that it is difficult to determine which test helped most in posting the .58 multiple correlation coefficient which they reported. Finally, Briskin and Stennis (1957) found the

MMPI useful for predicting success in Army Officer Candidate School, as did King (1959) for predicting success in Navy submarine school.

Hovey (1954) reported a study which resembles the present one, in which he used 137 student nurses who were undergoing practicum training in a VA neuropsychiatric hospital. After investigating the relationship between the students' grades on formal tests, their ward-practice ratings, and their MMPI profiles, he concluded that "student nurses tend to produce a characteristic MMPI profile with a predominant elevation on the Pd scale and secondary elevations on the Ma and Hy scales."

While the literature contains many articles in praise of the MMPI, there are many others which point to the futility of using this test to predict achievement or success. For instance, Brother Godfrey (1955) found "no correlation between scores on the MMPI and perseverance of the Brothers in the novitiate or in the first year of religious life." (Quinn, 1961) And Wauck (1957) reported that the predictive value of the MMPI in his study of seminarians was "practically zero."

Bennett and Gordon (1944), who used the MMPI to test 235 student nurses from various schools, concluded that the MMPI is "of little or no value as a part of a battery of tests in personnel selection, since it will predict neither the success of the student nor the attitudes of colleagues and supervisors." Weisgerber (1951) studied 72 junior and senior nurses, each of whom took the MMPI and was rated by supervisors and colleagues on 19 different

personality traits considered important for student nurses. When he found that there was "only a slight relationship" between the ratings which the students received on these traits and their MMPI scores, he concluded that "the MMPI cannot be used to predict success of training and occupational fitness." Mahler (1955) replicated Weisgerber's study and obtained similar results.

Hovey (1953) studied the MMPI profiles of 97 student nurses and endeavored to predict the final nursing grades which they would receive.

> High and low deviation on each scale, high and low mean score, wide and narrow spread between scale scores were tried, but significant relationships were not found. . . . A special scale for predicting grades was constructed, based on item analyses of "A" versus "D" students, but when the scale was applied to the new group of 40 students, prediction turned out to be little better than chance.

Finally, Knehr and Kohl (1959) studied three consecutive entering classes at a large medical school and found that "the hypothesis that students who would experience problems in adjustment during medical training could be detected by a quantitative personality inventory was not borne out."

In view of the negative reports of Hovey, Weisgerber, and others, it might seem better not to use the MMPI in this study. However, it seems to this investigator that most of the difficulties encountered by others in using the MMPI are inherent in personality testing as such. Because this field is still in its early years, the sort of precision or validity which is characteristic of

well-established tests, such as the Stanford-Binet, cannot be expected. And even in later years personality tests should not be expected to show the same stability as some other tests, since personality factors themselves are subject to frequent and sometimes quite dramatic changes.

Because a nursing school is a unique sort of educational institution, it seemed worthwhile to investigate the personality factors which contribute to success in this sort of school. And since the MMPI was judged to be the best personality instrument available for this investigation, it was used in this study. Moreover, a search of the literature failed to reveal any previous study of male student nurses.

There was the possibility, then, that the MMPI might successfully discriminate within this specialized group, even though it had failed to do so within other groups. Finally, as a result of this study it would be possible to construct the MMPI profile of successful and unsuccessful male student nurses, which prpfile might differ considerably from those of the normative sample and also from other groups already studied. Such a profile would perhaps be of some use to the nursing school, even if the MMPI were shown to fail as a discriminating instrument.

## CHAPTER IV

## REVIEW OF THE LITERATURE:
## THE THEMATIC APPERCEPTION TEST

The Thematic Apperception Test (TAT) was published by Christiana D. Morgan and Henry A. Murray in 1935 and quickly attained prominence in the field of projective personality techniques.

The materials for this test consist of 31 cards ($9\frac{1}{2}$" x 11"), on 30 of which are reproduced achromatically scenes suggesting situations or conflicts in which a person might imagine himself involved. These pictures usually depict one or two people, occasionally more. The remaining card is entirely blank.

According to the procedure recommended by Murray (1943) in the test manual, each subject receives the blank card and 19 of the other cards, the selection being determined by his age and sex. Ten cards are presented at the first testing session, the other ten at a later session, preferably on a different day.

When the experimenter judges that sufficient rapport has been established, he reads or recites the following instructions:

> This is a test of imagination, one form of intelligence. I am going to show you some pictures, one at a time, and your task will be to make up as dramatic a story as you can for each. Tell what has led up to the event shown in the picture; describe what is happening at the moment, what the characters are thinking and feel-

> ing, and then give the outcome. Speak your thoughts as they come to your mind. Do you understand? Since you have 50 minutes for 10 pictures, you can devote about five minutes to each story. Here is the first picture.

He then hands the first card to the subject and begins at once to record either by hand or by using some recording device exactly what the subject says and does, including an approximate timing of his pauses.

Many clinicians have found it expensive and inconvenient to have each subject spend two sessions relating his stories; moreover, they have found that some of the pictures do not seem to elicit very meaningful stories. Thus, many clinicians today use a smaller number of cards—10 or 12 or 13—and administer all of these at the same session. And because the male cards have been found generally to elicit more meaningful stories than the female cards, many investigators today use the male series for all subjects regardless of their sex.

The time consumed in administering the TAT remains an important factor and has led to the development of several substitute methods, of which group administration and self-administration are the most prominent. Group administration is accomplished by projecting the test pictures on a screen or blank wall in front of the group and asking each person to write out his stories according to the same instructions as those used in the individual administration of the test. One of the obvious disadvantages of this method is that the experimenter has little control over the length of the

stories. Since there are usually some members of the group who perceive, compose, and write more quickly than the others, it is difficult to keep the entire group working all the time.

Eron and Ritter (1951) found no significant difference in the results of group and individual administration, if the data were destined for research purposes, but they recommended that individual administration be retained in the clinical setting, lest important clinical data be lost. Lindzey and Heinemann (1955) likewise found no reportable differences between the data gained by either method. Sarason and Sarason (1958), however, disagreed with these investigators and contended that the type of administration does significantly affect the emotional tone and the outcome ratings of the stories. Kragh (1960) found that group administration led to a type of story which showed the subject's defensive need to come up with a story as quickly as possible.

In an effort to preserve the time-saving advantages of group administration, while allowing each subject to compose as briefly or as lengthily as he wishes without inconveniencing others, a procedure of self-administration was developed by several different investigators. According to this method the subject is handed the entire series of pictures on which he is to work, together with a set of instructions similar to these, which are adapted from Bellak (1954):

1. Please write a story about each picture in this series.
2. Do not look at the pictures before you are ready to write.
3. Look at one picture at a time, in the

order they are arranged, and write as dramatic story as you can about each. Tell what has led up to the event shown in the picture. Describe what is happening at the moment, what the characters are thinking and feeling. Then give the outcome. Write your thoughts as they come to mind.

4. It should not be necessary to spend more than about seven minutes on each story, although you may spend more time if you wish.
5. Number the stories as you go along, and put your name on each sheet.

Bellak (1954) fears that the time-saving advantage of this self-administration procedure is more than offset by such disadvantages as the subject's loss of spontaneity, the experimenter's inability to control the length of the stories, and his inability to intervene if the subject begins to be uncooperative in responding. On the other hand, Clark (1944) found that his subjects functioned better when they wrote out their own stories than when they merely recited or dictated them, and Arnold (1962) got the same result.

Despite the disadvantages which have been noted in the self-administration procedure and the additional disadvantage of needing a distinct set of pictures for each subject, with consequent limitation of the number of subjects who can be tested simultaneously, this was the procedure used in the present study.

It was noted in Chapter III that there are two methods of administering the MMPI—card sorting and paper-and-pencil notation—and two ways of scoring the paper-and-pencil version—by hand or by machine. In addition, the K value can be added or not added to the

raw scores of certain clinical scales according to the experimenter's preference. There are also different methods of interpreting MMPI profiles, as detailed in the books published on this subject. On the whole, however, the administration, scoring, and interpretation of the MMPI are fairly routine operations. The TAT, on the contrary, is not nearly so objective or well-standardized an instrument as is the MMPI. Several different methods of administering the TAT have been noted above, and others are likely to be developed. But it is in the scoring and interpretation of the TAT that the greatest diversity among authorities is encountered.

Murray (1943) suggested that each successive event in the stories be analyzed according to the needs of the hero and the environmental forces or "press" to which he is subjected. Many investigators have followed Murray's lead in substance, while adapting his ideas to their own preference and clinical requirements.

Combs (1946) urged that the interpretation be made in terms of the situations which the subject describes, the goals toward which his heroes strive, the frustrations which they suffer en route to these goals, and the action patterns by which they strive to resolve these frustrating situations. Shorr (1948) suggested that the stories be scored for their predominant mood, the chief worries expressed, the nature of the endings, and the kinds of press which are operating. Aron (1949) subscribed to emphasis on the manifest level of the story content, analyzed according to needs and press, but added a further analysis according to benefit and deprivation,

designed to bring the test into closer harmony with clinical, and especially psychoanalytic, theory.

Holt (1951) combined psychoanalytic theory with Murray's needs-press system in a method which is sometimes called "intuitive." According to this procedure the clinician reads over the stories, jots down tentative hypotheses as he goes, and then integrates these into his final summary. Korchin (1951), on the other hand, marks the return to the original Murray system, examining the characteristics of the heroes, the meaning of the main themes, outcomes, and levels of interpretation.

Other investigators have departed more or less widely from Murray's interpretive procedures. Some of these have merely added to his method. For instance, Tomkin (1947) analyzed stories according to four major categories—vectors, levels, conditions, and qualities—of fantasy production and according to a number of minor categories. Dana (1956) used personality orientation as the theoretical basis of his categories, which he identified as perceptual organization, range, and personalization. He reported that, when subjected to testing, these three categories and his three scorable aspects of test behavior—approach to the situation, normality of response, and rarity of response—showed diagnostic power of a high order. Henry (1956) developed an elaborate method of analyzing stories according to form characteristics (amount and kind of imaginal production, quality of organization, acuity of concepts, intraception-extraception, relation of story to total thought con-

tent) and content characteristics (general tone, positive-negative content, dynamic structure). This system involves the scrutiny of the interrelationship of form and content characteristics in eight different areas, namely, mental approach, creativity and imagination, behavioral approach, family dynamics, inner adjustment, emotional reactivity, sexual adjustment, and the descriptive and interpretive summary.

Other investigators sought to give the TAT stories more of an interpersonal interpretation than Murray's. For instance, Fine (1948) stressed primary feelings, outcomes, and interpersonal relationships, together with a qualitative summary of all the results. Joel and Shapiro (1949) constructed their system around the notion of ego-function, searching the stories for interpersonal feelings and analyzing these for the quality of the interaction portrayed.

Some investigators have objected to Murray's method and to many of the other methods which were intended to supplement or replace it on the grounds that these are all too "subjective." What they claim to want is an "objective" method which enables the clinician to quantify the interpretive features which, they say, are treated in vague and elusive ways in most of the other methods. The search for such an "objective" method seems to indicate an atomistic approach to personality evaluation in contrast to the holistic approach which has been characteristic of Murray and those who have followed him more or less closely.

White (1944) was among the first to try a quantitative ap-

proach. He proposed rewriting the manifest content of the stories in terms of 50 value words which represent motivating forces and carry discriminating weights. The verbal elements of the stories are thereby reduced to data which can be tallied and subjected to quantitative analysis.

Rotter (1946) used a complicated technique which called for scoring the stories according to 11 different aspects of personality and according to five different principles. Wyatt (1947a) elaborated 15 different variables according to which he analyzed the stories. Hartman (1949) assigned each story a score on a five-point scale for each of 65 different response categories and examined the resulting totals according to some 40 different personality variables.

Rosenzweig and Fleming (1949) advocated scrutiny of the stories for frequency of hero figures, objects, problems, and outcomes, and the tabulation of reaction times, total times, total words, and so forth. Eron (1950) evaluated each theme used by the subject according to a prepared checklist, which also provided for scoring the subject's level of interpretation and any perceptual distortions which he may have suffered. Klebanoff (1951) examined the content of the stories for overtly stated themata, which he grouped under previously determined categories and analyzed for absolute and percentage frequency of occurrence.

Along with this emphasis on the "objective" and quantitative approach went a steady movement for holistic, personalistic inter-

pretation of the stories. Sometimes the holistic approach was combined with a psychoanalytic interpretation theory, but the analytic viewpoint is not essential to the holistic approach. Lasaga y Travieso (1946) suggested that the interpreter read the record for general impressions, then summarize each story in terms of its main idea, attending to unusual words and reaction times, trying to find clues for the main conflicts, and integrating all of these points with what he knows of the subject's personal data.

Symonds (1949) urged that the interpreter keep in mind the TAT protocol as a whole rather than as a group of isolated stories or themes. Though it is necessary that the data be extracted in the form of themes, he thought that in the final summaries the interpreter should synthesize the themes of primary importance and indicate the dynamic relationships among them. Rotter and Jessor (1951) suggested that the protocol be analyzed for "leads" according to which the stories can all be organized into a combined unit and given at length a summary evaluation.

It is in this family of interpretive procedures—holistic, dynamic, interpersonal—that Arnold's method of sequential analysis belongs. The assumptions which underlie this method may be outlined briefly as follows (Petruaskas, 1959):

1. Everything imagined must have been experienced before in some way, in real life or in thought.
2. Each story with its stated outcome has a moral, proposes a conviction, either a casual conviction or one strongly held. In the latter case more than one story will express it.

3. When the stories with their outcomes are formulated as propositions, they will give a statement of the person's philosophy of life.
4. This philosophy is a working philosophy, that is, it indicates how people are thought to act or how they should act, what actions are right or wrong, what will lead to success, what are the things to strive for, and so forth.
5. Each story with its outcome contains an indication of the way in which the person handles his impulses and emotions, rather than an indication of the kind of emotions he has or their intensity.

Arnold recommends that the subject write his own stories, since she has found that this procedure leads to briefer and more meaningful stories than are obtained when he tells or dictates them to the examiner. The directions which she advises giving to the subject are almost identical with those given on pages 30 and 31 of this paper, except that she instructs the subject not to use dialogue in telling his stories, since she has found that its use complicates the scoring process.

Her interpretive method is a three-step process, which may be summarized as follows (Garvin, 1960):

> Summary. Each TAT story is summarized according to its significant meaning. The story is accepted at its face value; no meaning is projected into it. The meaning is stated in a generalized form, as if it were a brief characterization of the subject's life situation. However, it is not assumed that the subject is always speaking about himself in describing the hero's actions, but only that he is revealing his own principles of action. He indicates by the outcome whether he thinks the hero's action is right or wrong, commendable or blameworthy. This is a differ-

ent process from "projection" in the psychoanalytic sense or "hero identification." Even when the subject obviously identifies with the hero, it is his evaluation of the actions and attitudes of the hero which we try to state in the story summary and which reveal the subject's own values.

Sequence. The import of each story is written down in sequence. As this sequence unfolds, a pattern will generally emerge. A problem or alternative action that has a personal significance for the subject frequently is explored or approached from different points of view in subsequent stories, and possible solutions are evaluated.

Analysis. Examination of the sequence of imports usually supplies much relevant information about the subject's attitudes and motives. In this step he is seen working out his principles of action, that is, his problems and their possible solutions and the methods he relies upon to deal with his particular life situation. These methods can be viewed as the subject's effective motivational characteristics.

The mere process of constructing the imports and viewing their sequence will give the interpreter an impression that this record is "good" or "bad," "healthy" or "unhealthy." However, it may be desirable to assign numerical values to the imports, so as to achieve a quantitative basis for considering one import or one protocol "better" than another. To meet this need, Arnold devised a simple scoring system, according to which each import is assigned a numerical value, based on the quality of attitude or motivation which it contains, according to the scheme shown on page 39. In connection with this scoring system there arose a mild controversy, since some investigators insisted that the 1960 version was a four-point scale and the 1961 revision was in reality a five-point

scale. In her recent publication, however, Arnold (1962) accepts the later scoring system as a five-point scale and even assigns the middle value of "zero" to a limited number of imports.

| 1960 Scoring System | Attitude or Motivation which is..... | 1961 Revision of Scoring System |
|---|---|---|
| 4 | Strongly positive | + 2 |
| 3 | Weakly positive | + 1 |
| 2 | Weakly negative | − 1 |
| 1 | Strongly negative | − 2 |

In her recent manual Arnold lists in detail the various types of attitude, motivation, principle, and so forth, which receive each of the above scores. Each protocol can be given a "plus" or "minus" rating according to the sort of import which predominates, or the numerical values assigned to each import can be added together, to give a total "score" for each subject's protocol. In this way the protocols of various members of a group can be ranked.

It is not the purpose of this study to describe in detail this method of sequential analysis nor to compare it with other methods of TAT interpretation. These two projects have already been handled by Arnold herself and a series of investigators who worked with her—Snider (1953), Burkard (1958), McCandlish (1958), Petrauskas (1959), Garvin (1960), Quinn (1959, 1961), Steggert (1961), and Vassiliou (1962). The system has been described in some detail, however, because it was used in this study. For this reason, too, it is appropriate to review briefly some of the studies in which

the TAT was used for purposes of discrimination. Only the more recent and relevant studies will be cited, since the entire list is too long to be reviewed in detail and little purpose would be served in doing so.

Harrison and Rotter (1945) found that, when TAT stories were scored for indications of stability and emotional maturity, they correlated .75 with the judgment of independent examiners who were charged with evaluating the candidates' fitness to serve as officers in the armed forces. Horrall (1957) reported that the TAT successfully distinguished high-IQ high-achievers from high-IQ low-achievers in a group of 188 college seniors, whereas it failed to distinguish within the same group between those with high IQ and those with low IQ. Lyle and Gilchrist (1958) found that the TAT successfully distinguished between delinquent and non-delinquent male adolescents.

Thus, it seems that the TAT measures an attitude or a personality characteristic or a degree of motivation which is an important component of success in academic and non-academic situations, but which is not identical with the IQ nor revealed by it. This evaluation of the TAT is in substantial agreement with Hartman's (1949) finding, that the TAT "is diagnostic of major areas of personality and yields statistically and clinically significant predictors of behavior and personality."

On the other hand, Ohlsen and Schultz (1955) reported that blind analyses of TAT stories were not successful in distinguishing

the best 15% of student teachers from the poorest 15%, as determined by the ratings of their supervisors. Since the experimental design of the present study is similar to that of Ohlsen and Schultz's investigation, their negative report should be kept in mind in evaluating the results of the present study.

Using the earliest version of Arnold's method, Snider (1953) found "highly significant" differences between stories told by high achievers and those told by low achievers among 40 high-school seniors. His experiment was criticized, however, by Riggs, who claimed that it was so "vaguely specified that replication would be impossible." (Garvin, 1960) After Arnold's method had been rigorously overhauled, McCandlish (1958) used it again to study high-school students and reported that it successfully distinguished high achievers from low achievers in 97.5% of the cases. With the same method Burkard (1958) successfully distinguished good teachers from poor ones, and Petrauskas (1959) distinguished offenders from non-offenders in a naval installation.

Quinn (1961) conducted an ingenious experiment in which he secured a series of judgments as to the fitness for religious life of a group of candidates for the religious Brotherhood. These judgments were made by the candidates' superiors, by a group of Brothers just immediately senior to the candidates, and by the candidates themselves, each candidate submitting a judgment about each of the other candidates, but not about himself. When the candidates then wrote out their TAT stories and these had been

scored according to Arnold's method of sequence analysis, Quinn found that the scores correlated .61 with the judgments of the superiors, .59 with the judgments of the Brothers immediately senior to the candidates, and .57 with the judgments of the candidates' own group.

Finally, Arnold (1962) claims that the method of story sequence analysis is

> useful for discovering positive and negative motivation in normal people, both through the scoring system and through the clinical evaluation made possible on the basis of the sequence of story imports. This can be a valuable aid in the selection of students for higher institutions of learning or the selection of candidates for responsible positions. Selection based on intelligence alone has a percentage of risk that needs reduction. An additional knowledge of motivation will make it possible to gauge performance in a far more satisfactory manner. Story sequence analysis thus can be of help in a number of areas where knowledge of prospective levels of performance is useful.

A review of the literature cited in this and the preceding chapters, therefore, shows that success is claimed for both the MMPI and the TAT in distinguishing between successful and unsuccessful aspirants for various sorts of occupations and vocations. It also shows that several investigators have reported that these tests are not effective in performing such a task. Despite such warnings these tests have been used in the present study because they seemed to be the best available. How they were used and the results which they gave are discussed in the following chapters.

# CHAPTER V

## THE SUBJECTS AND THE METHOD

Fifty-nine young men began nurses' training in August, 1960, at the school being studied in this research. This group will hereafter be referred to as the "Class of 1963," since that is the year of their anticipated graduation.

They came from 20 different States of this country, from Puerto Rico, and from Canada. Forty-three of them (nearly 73% of the total) were residents of the seven midwestern States of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin.

Eleven men had previously served in the armed forces—five in the navy, three in the air force, two in the army, and one in the national guard. Twenty-seven men (almost 46% of the total) had done some previous college work. Twelve had worked as orderlies or technicians in hospitals, five of them previously serving as hospital corpsmen during military service.

Forty-nine men (slightly more than 83% of the total) were Roman Catholics. Among the others there were two Lutherans, two Methodists, one Quaker, and five undifferentiated "Protestants." Thirteen members of this class were religious Brothers; the rest were secular students. All 59 men were single at the time they started training. Other characteristics of the class are given in Table 1.

Table 1

Certain Characteristics of the Class of 1963 (N=59)

| | Range | Mdn | M | SD |
|---|---|---|---|---|
| Age (in years) | 17.75 - 36.33 | 20.43 | 21.48 | 3.32 |
| IQ (#) | 87 - 156 | 119.17 | 119.63 | 13.35 |
| Siblings: | | | | |
| Brothers | 0 - 7 | 1.28 | 1.67 | 1.55 |
| Sisters | 0 - 7 | 1.31 | 1.44 | 1.39 |

(#) as measured by the California Test of Mental Maturity

One year later, that is, in August, 1961, 46 young men began nurses' training at the same school. This group will hereafter be referred to as the "Class of 1964," since that is the year of their anticipated graduation.

They came from 14 different States. Thirty-eight of them (nearly 83% of the total number) came from the seven midwestern States of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin.

Twelve men had previously served in the armed forces—seven in the navy, four in the army, and one in the air force. Nineteen men (about 41% of the total number) had done some previous college work. Thirty of them had previously served as orderlies, technicians, or hospital corpsmen—20 as civilians, five during military service, five others both as civilians and as military personnel.

Thirty men (about 65% of the total) were Roman Catholics. Among the others there were four Lutherans, three Baptists, one Episcopalian, one Methodist, one Presbyterian, one member of the United Brethren, and five undifferentiated "Protestants." Two members of this class were religious Brothers; all the others were secular students. All 46 men were listed as single at the start of their training, but one man subsequently revealed that he was married before his testing had been finished. Other characteristics of this class are given in Table 2.

Table 2

Certain Characteristics of the Class of 1964 (N=46)

| | Range | Mdn | M | SD |
|---|---|---|---|---|
| Age (in years) | 17.50 - 29.50 | 20.23 | 20.96 | 2.87 |
| IQ (#) | 97 - 154 | 120.50 | 120.24 | 12.41 |
| Siblings: | | | | |
| Brothers | 0 - 6 | 2.00 | 2.02 | 1.66 |
| Sisters | 0 - 5 | 0.91 | 1.26 | 1.41 |

(#) as measured by the California Test of Mental Maturity

Table 3 shows that the differences between these two classes in matters of age, intelligence, and family constellation are not of statistical significance.

The members of the Class of 1963 took the MMPI in September,

Table 3

*t* ratios, giving statistical significance of differences between means of the Class of 1963 and the Class of 1964 on characteristics given in Tables 1 and 2

| Characteristic | *t* ratio |
|---|---|
| Age (in years) | 0.589 |
| IQ | —0.240 |
| Siblings: | |
| Brothers | —1.096 |
| Sisters | 0.648 |

— indicates difference in favor of Class of 1964 over Class of 1963

1960, during their first week in nurses' training. The papers were machine-scored by Testscor of Saint Paul, Minnesota, and later checked and profiled by this investigator. A year later, that is, in September, 1961, the Class of 1964 took the MMPI during their own first week of training. At about the same time the school furnished to this investigator the performance records of the Class of 1963 for the entire first-year training period.

It was expected that a careful study of the MMPI records of the Class of 1963 in the light of their first-year performance would reveal certain characteristics which distinguished the successful students from the unsuccessful ones. Examination of the MMPI records of the Class of 1964 for these same characteristics would then enable the investigator to predict the performance of

this class during the first year of training. One year later, that is, in September, 1962, the actual first-year performance records of this class would show how accurate the prediction had been. Such was the original design of this study.

Because several of the studies cited in Chapter III had questioned the validity of predictions based on the MMPI, whereas many studies cited in Chapter IV had ascribed just this sort of predictive power to the TAT, it was decided to administer both the MMPI and the TAT to the Class of 1964 and to compare the relative efficiency of these two tests in predicting achievement in the specialized atmosphere of an all-male nursing school. Such was the final design of this study. The results are given in the following chapters.

The booklet form of the MMPI was administered to each group in the same large, bright classroom of the school on the first Saturday morning that each group was in training. The instructions of the test authors were followed throughout.

Certain adjustments were made, however, in the administration of the TAT. It was decided to use only thirteen cards because of the severe time restrictions under which the students were operating. Those used were Cards 1, 2, 3BM, 4, 6BM, 7BM, 10, 11, 13MF, 14, 16, 17BM, and 20. Use of Cards 1, 2, 3BM, 4, 6BM, 7BM, 11, 13MF, 14, 16, and 20 has become so standard as to require no justification here. However, the reasons which prompted the substitution of Cards 10 and 17BM for the more usual Cards 8BM and 9BM de-

serve mention here.

Cards 10 and 17BM were used because they are thought to elicit the subject's attitudes and feelings in an area of concern for an all-male school. Cards 8BM and 9BM were omitted principally because of the exigencies of time. However, a further reason for omitting Card 8BM was that the scene depicted on that card is so "usual" for this specialized group and one which occurs in response to so many other cards that its inclusion seemed superfluous. It is regrettable that Card 9BM was not used, since it frequently elicits stories indicative of the subject's attitudes towards work. Arnold has suggested, though, that the total number of cards used be an odd number, so as to eliminate the possibility of a tie in the "plus-minus score" of the protocol. Since her methods of self-administration and interpretation were used in this study, it seemed reasonable to follow this suggestion of hers as well. Thus, Card 9BM was omitted.

The cards used in this study, therefore, were exactly those used by Petrauskas (1959) in his study of naval offenders and non-offenders, except for the substitution of Card 10 for his Card 8BM.

## CHAPTER VI

## RESULTS: THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

When the first-year performance records of the Class of 1963 became available in September, 1961, it was possible to compare the MMPI profiles of the successful students with those of the unsuccessful students. That is to say, it was possible to make such a comparison once it had been determined which students had been successful and which had not.

It will be remembered that the Class of 1963 numbered 59 men at the outset. On September 1, 1961, the date which marked the end of their first year of training, 36 of these men were still in training at the same school. It seems obvious that these men should be considered "successful," even though they differed among themselves as to the degree of their success. The school officials assured this investigator that, of the 23 men no longer in training at the school on September 1, 1961, 17 definitely would not be allowed to re-enter the school, even if they should make such a request. It seems obvious that these 17 men are to be considered "unsuccessful" in nurses' training.

Of the remaining six, three were reliably reported to be in training at other nursing schools to which they had transferred for

personal reasons. It seemed reasonable to consider these men "successful" for the purposes of this study and to add them to the 36 men already designated as such.

According to school officials the remaining three men were eligible to resume training in that school if they should want to do so. One man had transferred to a seminary, to study for the priesthood.[2] Another had interrupted his training because of illness, with the announced intention of resuming it when he had recuperated, but he had not as yet resumed training. The third had withdrawn from the school, reportedly to attend another nursing school nearer his home, but there was no reliable assurance that he had actually enrolled in the other school. Thus, according to the criterion of continuing success in nurses' training these three men would have to be considered unsuccessful. On the other hand, it seems clear that their condition is far different from that of the 17 who have already been labeled "unsuccessful." Since both the "successful" and the "unsuccessful" categories seemed likely to be contaminated by the records of these three men, it was decided simply to omit their records from this study.

When the MMPI was administered to the Class of 1963, only 57 men were present for the test. One man had already withdrawn from the school; the other was ill that day. Although background infor-

[2]This man actually did resume nurses' training at the school after one year in the seminary. Upon his return he became a member of the Class of 1964. Lest his records confuse the results of this study, however, they have been omitted entirely.

mation, high-school records, and so forth, were available for each of these men, their records were not included in any phase of this study because of the absence of MMPI records for them. Thus, the actual subjects of this study number 54 men—38 who have been labeled "successful" and 16 who have been called "unsuccessful."

The MMPI data for the Class of 1963 are summarized in Table 4 (page 52). The first step in the analysis of these data was to compare the scale means of the 38 "successful" students (Cf. Table 5, page 53) with the means of the 16 "unsuccessful" students (Cf. Table 6, page 54). As seen in Table 7 (page 55), only three of the scales have differences of statistical significance—Hs and Sc at the .05 level of confidence and Ma at the .02 level of confidence. It seemed that the data contained in the MMPI records should result in more than three significant differences between a "successful" and an "unsuccessful" group. If the data were analyzed differently, perhaps more discriminable characteristics would emerge.

Kelley (1939) has shown that the differences which exist within a group are most discriminable when the upper 27% of the group is compared with the lower 27%. Since 27% of this group is almost 16—it is 14.58 exactly—and since there were exactly 16 "unsuccessful" members of this class, the use of Kelley's method was deemed appropriate. In order to make this comparison, however, it was necessary to designate the 16 "best" or "most successful" members of the "successful" group. There were several different ways in which this could be done.

Table 4

MMPI T scores for the Class of 1963 (N=54)

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 30* | 1.86 | 3.26 | 5.48 |
| L | 0 - 8* | 2.42 | 2.83 | 2.16 |
| | 36 - 63 | 45.75 | 46.07 | 6.97 |
| F | 0 - 10* | 3.75 | 3.96 | 2.65 |
| | 44 - 66 | 52.00 | 52.72 | 6.08 |
| K | 36 - 66 | 50.83 | 51.33 | 7.49 |
| Hs | 31 - 67 | 48.75 | 49.83 | 8.68 |
| D | 29 - 69 | 47.90 | 48.34 | 10.10 |
| Hy | 36 - 71 | 53.50 | 52.84 | 6.73 |
| Pd | 36 - 75 | 53.75 | 53.69 | 9.87 |
| Mf | 41 - 75 | 54.83 | 55.82 | 8.07 |
| Pa | 41 - 62 | 51.06 | 52.22 | 5.98 |
| Pt | 38 - 83 | 52.00 | 53.61 | 10.50 |
| Sc | 36 - 69 | 51.33 | 52.78 | 7.61 |
| Ma | 33 - 78 | 58.30 | 56.19 | 9.62 |
| Si | 32 - 73 | 43.50 | 45.49 | 8.41 |

Mean of means for 10 clinical scales: 52.08

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 5

MMPI T scores for "successful" members of the Class of 1963 (N=38)

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 30* | 1.50 | 3.76 | 6.10 |
| L | 0 - 8* | 2.39 | 2.87 | 2.23 |
| | 36 - 63 | 43.07 | 45.84 | 7.41 |
| F | 0 - 10* | 2.70 | 3.45 | 2.87 |
| | 44 - 66 | 49.30 | 51.53 | 6.47 |
| K | 36 - 66 | 54.50 | 51.89 | 7.64 |
| Hs | 31 - 67 | 48.79 | 48.42 | 7.98 |
| D | 29 - 68 | 45.83 | 47.11 | 10.25 |
| Hy | 36 - 62 | 53.50 | 51.89 | 6.29 |
| Pd | 26 - 69 | 54.17 | 52.58 | 7.61 |
| Mf | 41 - 75 | 53.83 | 55.34 | 8.84 |
| Pa | 44 - 62 | 50.17 | 52.34 | 5.77 |
| Pt | 38 - 83 | 51.50 | 52.71 | 10.79 |
| Sc | 36 - 69 | 50.90 | 51.45 | 7.90 |
| Ma | 33 - 75 | 54.50 | 54.42 | 9.09 |
| Si | 32 - 73 | 42.21 | 45.84 | 9.48 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 6

MMPI T scores for "unsuccessful" members of the Class of 1963 (N=16)

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 13* | 1.60 | 2.06 | 8.56 |
| L | 0 - 8* | 2.50 | 2.75 | 2.22 |
| | 36 - 63 | 44.50 | 45.62 | 6.58 |
| F | 3 - 8* | 4.83 | 4.18 | 1.42 |
| | 50 - 62 | 55.50 | 55.56 | 8.91 |
| K | 42 - 66 | 49.50 | 49.62 | 6.34 |
| Hs | 39 - 67 | 53.50 | 53.62 | 8.95 |
| D | 36 - 69 | 51.50 | 51.19 | 8.95 |
| Hy | 44 - 71 | 55.50 | 55.31 | 6.93 |
| Pd | 46 - 75 | 55.00 | 55.69 | 8.22 |
| Mf | 45 - 74 | 58.50 | 57.31 | 6.32 |
| Pa | 41 - 62 | 50.50 | 51.94 | 6.46 |
| Pt | 38 - 69 | 54.50 | 55.69 | 8.56 |
| Sc | 42 - 69 | 55.80 | 56.38 | 7.17 |
| Ma | 45 - 78 | 60.50 | 61.31 | 8.96 |
| Si | 36 - 55 | 45.17 | 44.81 | 5.20 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 7

t ratios, giving statistical significance of differences between MMPI scale means of 38 "successful" and 16 "unsuccessful" members of the Class of 1963

| Scale | t |
|---|---|
| L | 0.108 |
| F | —1.637 |
| K | 1.128 |
| Hs | —2.012 ** |
| D | —1.464 |
| Hy | —1.701 |
| Pd | —1.297 |
| Mf | —0.923 |
| Pa | 0.214 |
| Pt | —1.078 |
| Sc | —2.237 ** |
| Ma | —2.570 *** |
| Si | 0.512 |

— indicates difference in favor of better adjustment of the "successful" members of the class over the "unsuccessful" members

** significant beyond the .05 level of confidence

*** significant beyond the .02 level of confidence

Grades were available, showing each student's evaluation by his teacher in each of the wide range of subjects studied during the first year. Thus, it was possible to rank the 38 "successful" members of the class according to their grade-point averages and to designate the top 16 men as the "most successful." However, several of the studies cited in Chapter III had questioned the accuracy of evaluating student nurses solely on the basis of classroom performance. Since the school officials also objected to this procedure, it was decided to designate the "most successful" students in some other way.

As the students complete the various major sections of their training, they take the National League for Nursing (NLN) tests in each of these areas. These are nationally-standardized tests, which report a raw score, a standard score, and a percentile rank, based on different norms for degree schools and diploma schools. By September 1, 1961, the members of the Class of 1963 had each taken the NLN tests in the areas of anatomy and physiology, chemistry, and microbiology. From the available results it was possible to rank the 38 "successful" members of the class on the basis of all or each of these tests and in this way to designate the 16 "most successful" members of the group. The objections to this procedure, however, were virtually the same as those which had been raised against use of classroom performance as the sole criterion of success, and they had the same result. Some other basis of determining the 16 "most successful" students had to be found.

Since the officials of the school are presumably in the best position to know which students are in the process of becoming the most effective nurses, it was decided to ask these officials to rank each of the continuing students. The criterion on which they were asked to base their judgment was "overall suitability as nurses." Admittedly this is a vague and general expression, but it was used without further elaboration or specification because in this way the constriction exerted on the evaluators seemed minimal.

The director of the school and five instructors did the evaluating. Each of them was given a paper on which were listed in alphabetical order the names of the 38 continuing members of the Class of 1963. Each evaluator was asked to rank the most suitable student #1, the next most suitable student #2, and so forth down to the least suitable student, who was ranked #38. Six independent evaluations of each student were obtained in this way, and a composite evaluation was obtained by adding together the six individual evaluations. The 16 students with the smallest total were designated the "most successful" members of the class.

The MMPI scale means of these 16 "most successful" students (Cf. Table 8, page 58) were compared with the scale means of the 16 "unsuccessful" students (Cf. Table 6, page 54), in accordance with Kelley's suggestion, mentioned before (page 51). But this comparison showed that the differences between the means were of no more statistical significance (Cf. Table 7, page 55, and Table 9, page 59) than were the differences between the scores of the 16

Table 8

MMPI T scores of the 16 "most successful" members of the Class of 1963, as determined by faculty evaluation

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 18* | 1.50 | 3.56 | 5.56 |
| L | 0 - 7* | 2.83 | 3.00 | 2.29 |
| | 36 - 60 | 45.50 | 46.31 | 7.67 |
| F | 0 - 10* | 1.50 | 2.69 | 2.84 |
| | 44 - 66 | 46.50 | 49.75 | 6.33 |
| K | 41 - 66 | 56.50 | 54.06 | 7.14 |
| Hs | 31 - 67 | 48.50 | 49.00 | 9.86 |
| D | 32 - 68 | 47.83 | 50.56 | 10.17 |
| Hy | 36 - 62 | 54.50 | 52.31 | 8.00 |
| Pd | 39 - 60 | 55.00 | 52.06 | 7.80 |
| Mf | 41 - 75 | 56.50 | 55.13 | 7.66 |
| Pa | 44 - 62 | 53.50 | 53.44 | 6.03 |
| Pt | 38 - 83 | 52.50 | 56.06 | 12.96 |
| Sc | 38 - 69 | 50.50 | 52.00 | 9.01 |
| Ma | 33 - 73 | 50.00 | 53.19 | 9.23 |
| Si | 35 - 64 | 47.50 | 47.75 | 9.32 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 9

t ratios, giving statistical significance of differences between MMPI scale means of 16 "most successful" and 16 "unsuccessful" members of the Class of 1963

| Scale | t |
|---|---|
| L | 0.273 |
| F | —2.126 ** |
| K | 1.860 |
| Hs | —1.388 |
| D | —0.186 |
| Hy | —1.134 |
| Pd | —2.211 ** |
| Mf | —0.878 |
| Pa | 0.673 |
| Pt | 0.095 |
| Sc | —1.522 |
| Ma | —2.525 *** |
| Si | 1.200 |

— indicates difference in favor of better adjustment of the "most successful" members of the class over the "unsuccessful" members

** significant beyond the .05 level of confidence

*** significant beyond the .02 level of confidence

"unsuccessful" students and those of the whole group of 38 "successful" ones who were compared earlier. In fact, the earlier results were more significant, since they showed differences on three clinical scales—Hs, Sc, and Ma—whereas the later comparison showed differences on only two clinical scales—Pd and Ma. Since student nurses in general score higher on these two scales than do others of their age (Hovey, 1954), it is important to note that the "unsuccessful" members of the present group scored enough higher than the "successful" members that these scales were still able to distinguish them.

Among the 16 students judged "most successful" five were Brothers. Since many earlier studies (Bier, 1948; Wauck, 1957; Rice, 1958) have shown that seminarians and religious differ from the general population in many ways, it was decided to compare the 16 "unsuccessful" students with the 16 "most successful" non-Brothers, in an effort to learn what effect, if any, the inclusion of the Brothers exerted on the profile of the "most successful" group.

That the influence of the Brothers was considerable is shown by the differences in scale means, when their records were not included (Cf. Table 6, page 54; Table 10, page 61; and Table 11, page 62). Four of the clinical scales showed significant differences, whereas before only three of the differences were statistically significant. More important, the L, Pa, and Pt scales, which originally had positive t ratios, indicating better adjustment on the part of the "unsuccessful" students, now had negative t ratios,

Table 10

MMPI T scores of the 16 "most successful non-Brother" members of the Class of 1963, as determined by faculty evaluation

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 18* | 1.78 | 3.00 | 5.57 |
| L | 0 - 6* | 1.50 | 2.31 | 1.99 |
| | 36 - 56 | 40.50 | 43.94 | 6.65 |
| F | 0 - 10* | 2.50 | 3.69 | 3.40 |
| | 44 - 66 | 47.83 | 51.94 | 7.68 |
| K | 38 - 64 | 52.50 | 51.00 | 7.40 |
| Hs | 31 - 67 | 48.50 | 47.25 | 9.13 |
| D | 32 - 65 | 46.50 | 46.69 | 8.89 |
| Hy | 36 - 62 | 49.50 | 49.81 | 6.79 |
| Pd | 39 - 60 | 55.50 | 52.50 | 6.81 |
| Mf | 41 - 63 | 51.50 | 51.28 | 7.44 |
| Pa | 44 - 62 | 49.50 | 51.13 | 4.56 |
| Pt | 38 - 79 | 50.00 | 52.75 | 11.16 |
| Sc | 38 - 69 | 49.17 | 49.88 | 8.22 |
| Ma | 45 - 73 | 50.50 | 54.00 | 8.59 |
| Si | 35 - 64 | 42.50 | 45.75 | 8.47 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 11

t ratios, giving statistical significance of differences between MMPI scale means of 16 "most successful non-Brothers" and 16 "unsuccessful" members of the Class of 1963

| Scale | t |
|---|---|
| L | —0.718 |
| F | —1.231 |
| K | 0.567 |
| Hs | —1.995 |
| D | —1.427 |
| Hy | —2.268 ** |
| Pd | —1.195 |
| Mf | —2.471 *** |
| Pa | —0.412 |
| Pt | —0.836 |
| Sc | —2.385 ** |
| Ma | —2.356 ** |
| Si | 0.378 |

— indicates difference in favor of better adjustment of the "most successful" non-Brothers over the "unsuccessful" members of the class

** significant beyond the .05 level of confidence

*** significant beyond the .02 level of confidence

indicating better adjustment on the part of the "most successful" non-Brothers. The F and Pd scales remained negative but lost their statistical significance, while the Hy, Mf, and Sc scales acquired statistical significance. Only the Ma scale retained its significance in the same degree and the same direction as it had had when the Brothers' records were included.

The importance of all this is to indicate that the Brothers, as a group, are more reserved, more defensive, more introspective, more compulsive, more cultured, and at the same time somewhat more depressed than the secular students, as a group. Thus, whenever any considerable number of Brothers are included in a "successful" group, their presence has the effect of tipping this group's MMPI scale means in the direction of the "unsuccessful" group and thereby renders differences between these two groups less significant than they would be. This is not to say that the Brothers are poorly adjusted nor that there is a "halo effect" at work in their favor—although both points merit investigation—but it does indicate that a group of student nurses with several Brothers in it is not typical of the entire population of male student nurses.

Even after the records of the Brothers were excluded, however, the results were not of such magnitude as to justify the suggestion to the school that it add the MMPI to its selection battery. If this suggestion were to be made, the data would have to be shown to contain more significant discriminating characteristics.

Bier (1948) had divided his group of subjects into a well-

adjusted portion and a poorly-adjusted portion on the basis of their "total adjustment." This he determined by adding together each subject's T scores on the nine clinical scales of the MMPI which were in use at that time. He reasoned that this procedure

> appeared basically justifiable since we are dealing with standard measures which could be compared with one another and which could be combined into total scores. . . . The additive totals which we employed appeared to yield the general picture of adjustment which was desired. The MMPI is so constructed that on all the scales satisfactory adjustment is indicated by low scores, poor adjustment by high scores. The tendencies, therefore, of all the scales are in the same direction, and hence the higher total score would be indicative of poorer general adjustment and the lower general score of more satisfactory adjustment.

It was decided, therefore, to rank the 57 members of the Class of 1963 who had taken the MMPI on the basis of a single "total adjustment" score, this score being the sum of each subject's T scores on the ten clinical scales which are now commonly used. Those with the smallest total T score, in view of the above reasoning, are to be considered the "best adjusted," whereas those with the largest total T score are to be considered "most poorly adjusted."

When the names or numbers of these students are listed in the order of their "total adjustment" — #1 being the student with smallest total T score, therefore presumably "best adjusted"; #2, the student with second-smallest total T score, therefore presumably "second-best adjusted"; and so forth down to #57, who is the

student with the largest total T score, therefore presumably the "most poorly adjusted" — and when each one's status after one year of nurses' training is compared with his adjustment ranking (Cf. Table 12, page 66), there emerges a strong tendency for the students with the best "total adjustment" score to be still engaged in nurses' training and, conversely, for those with the poorest "total adjustment" score to have been eliminated from nurses' training. Just how impressive this trend really is can be seen from the contingency table (Table 13, page 67), which shows that the likelihood of encountering such results by chance is less than one in 100.

Among the six members of the Class of 1963 with the poorest "total adjustment," as determined by the MMPI, were four Brothers. Despite their showing on the MMPI, these men were still engaged in nurses' training and presumably were at least moderately successful. In seeking an explanation for this anomaly, one does well to remember Bier's (1948) report that his seminary group was "the most deviant portion of an already deviant population the college group ." He suggested that "the consistent tendency of the seminary group to score higher than the normative group on all MMPI scales seems to indicate the necessity of introducing some modification in these general norms in adapting the test for seminary use."

Wauck (1957) disagreed with several features of Bier's study, but he agreed with him in this, that among seminarians "one not infrequently encounters the paradoxical findings wherein the better adjusted get 'poorer' MMPI scores." For this reason he questioned

Table 12

Class of 1963, ranked according to total adjustment, that is, according to total MMPI T score

| | | | |
|---|---|---|---|
| 1 | 16 # | 30 # | 44 # |
| 2 | 17 | 31 | 45 # |
| 3 & | 18 | 32 # | 46 |
| 4 | 19 # | 33 | 47 # |
| 5 | 20 | 34 | 48 # |
| 6 | 21 # | 35 " | 49 # |
| 7 | 22 | 36 | 50 " |
| 8 | 23 | 37 | 51 # |
| 9 | 24 | 38 | 52 |
| 10 | 25 | 39 | 53 # |
| 11 # | 26 | 40 | 54 |
| 12 " | 27 | 41 & | 55 # |
| 13 | 28 | 42 & | 56 |
| 14 # | 29 | (564)——————(564) | 57 |
| 15 | | 43 # | |

\# "Unsuccessful" student. Has discontinued training at this school, not eligible to resume.

& Has discontinued training for personal reasons, eligible to resume training at this school. His record is not included in this study.

" Now in training at some other school of nursing.

Numbers without any symbols refer to students who concontinue in training at this school.

the propriety of using the MMPI with such a unique and specialized population. Rice (1958) agreed with both of these investigators, that seminarians and religious constitute a specialized group, but he defended the use of the standard MMPI with these subjects because of the demonstrable advantages of being able to compare one's findings with other published results, something which would not be possible if the test were altered.

Table 13

Contingency table, showing first-year performance of Class of 1963, distinguished on basis of total adjustment

| First-year Performance | According to total MMPI T scores | | Total |
|---|---|---|---|
| | Well-adjusted | Poorly-adjusted | |
| "Successful" | 32 | 6 | 38 |
| "Unsuccessful" | 7 | 9 | 16 |
| Total | 39 | 15 | 54 |

$\chi^2 = 7.281$

$P < .01$

Perhaps it is true that on occasion a rather poorly-adjusted member of a religious Institute is retained in the Institute and even in the program of nurses' training despite a degree of maladjustment which would prompt the dismissal of a secular student, but

this is not to be thought true of all the Brothers who received "poor" total adjustment scores on the MMPI. On the other hand, since earlier studies have shown that seminarians and religious are characteristically more defensive, introspective, and compulsive than other men of their age, it seems advisable not to use the MMPI in selecting nursing-school candidates who are religious or at least to develop special norms for them before doing so.

When the mean scores of the 15 "best adjusted" members of the Class of 1963 (Cf. Table 14, page 69) were compared with the mean scores of the 15 "most poorly adjusted" members of that class (Cf. Table 15, page 70), adjustment being determined by total T scores, the differences between these two groups attained a high degree of statistical significance (Cf. Table 16, page 71). At this point in the study it seemed that Bier's (1948) method of "total adjustment" scores would be the best way to use the MMPI for nursing-school selection.

It seems certain that the MMPI measured a dimension of personality which is not measured by the IQ, classroom evaluations, clinical ratings, NLN tests, or instructors' evaluations of "overall suitability." It will be noted in Table 17 (pages 72 and 73) that some of the instructors tended to rank the students more in accordance with measures of intellectual ability or achievement, whereas others appear to have interpreted "overall suitability" as something different from either of these. The correlations range all the way from a high of .834 to a low of

Table 14

MMPI T scores of the 15 "best adjusted" members of the Class of 1963, as determined by total adjustment, that is, by total MMPI T scores

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 30* | 2.10 | 5.00 | 8.02 |
| L | 0 - 6* | 1.38 | 2.27 | 2.14 |
| | 36 - 56 | 40.25 | 43.80 | 7.13 |
| F | 0 - 6* | 1.70 | 2.13 | 1.63 |
| | 44 - 58 | 47.00 | 48.53 | 3.83 |
| K | 41 - 57 | 50.00 | 49.27 | 5.80 |
| Hs | 31 - 49 | 42.30 | 43.13 | 4.73 |
| D | 32 - 51 | 42.17 | 42.13 | 4.95 |
| Hy | 36 - 57 | 49.00 | 49.07 | 5.87 |
| Pd | 36 - 60 | 47.50 | 47.13 | 7.19 |
| Mf | 41 - 65 | 51.17 | 51.93 | 6.88 |
| Pa | 44 - 56 | 47.90 | 48.00 | 3.16 |
| Pt | 38 - 53 | 44.00 | 45.13 | 5.35 |
| Sc | 36 - 51 | 43.50 | 44.00 | 4.37 |
| Ma | 33 - 65 | 49.50 | 50.07 | 8.25 |
| Si | 32 - 55 | 40.83 | 41.27 | 5.99 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 15

MMPI T scores of the 15 "most poorly adjusted" members of the Class of 1963, as determined by total adjustment, that is, by total MMPI T scores

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 13* | 1.88 | 3.00 | 3.67 |
| L | 0 - 8* | 2.50 | 2.93 | 2.17 |
| | 36 - 63 | 44.83 | 46.27 | 7.25 |
| F | 1 - 10* | 4.67 | 5.07 | 2.59 |
| | 46 - 66 | 54.83 | 55.20 | 5.91 |
| K | 36 - 66 | 51.50 | 51.87 | 7.75 |
| Hs | 34 - 67 | 58.83 | 56.60 | 8.68 |
| D | 48 - 69 | 58.00 | 58.47 | 8.05 |
| Hy | 45 - 71 | 58.83 | 58.93 | 5.94 |
| Pd | 46 - 75 | 57.50 | 58.60 | 7.14 |
| Mf | 43 - 75 | 60.00 | 60.93 | 8.87 |
| Pa | 41 - 62 | 60.63 | 57.00 | 6.45 |
| Pt | 52 - 83 | 63.75 | 65.47 | 8.79 |
| Sc | 51 - 69 | 63.50 | 61.27 | 5.74 |
| Ma | 45 - 78 | 59.50 | 58.73 | 9.38 |
| Si | 41 - 73 | 50.83 | 52.53 | 9.02 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 16

t ratios, giving statistical significance of differences between MMPI scale means of the 15 "best adjusted" and the 15 "most poorly adjusted" members of the Class of 1963

| Scale | t |
|---|---|
| L | —0.939 |
| F | —3.784 ***** |
| K | —1.040 |
| Hs | —5.278 ***** |
| D | —6.694 ***** |
| Hy | —4.573 ***** |
| Pd | —4.260 ***** |
| Mf | —3.104 **** |
| Pa | —4.852 ***** |
| Pt | —7.657 ***** |
| Sc | —9.270 ***** |
| Ma | —2.686 *** |
| Si | —4.025 ***** |

— indicates difference in favor of better adjustment of the "best adjusted" over the "most poorly adjusted" members

*** significant beyond the .02 level of confidence

**** significant beyond the .01 level of confidence

***** significant beyond the .001 level of confidence

Table 17

Spearman rank-order correlations of various evaluations and scores of the Class of 1963

| | | FACULTY EVALUATORS | | | | | |
|---|---|---|---|---|---|---|---|
| | | #2 | #3 | #4 | #5 | #6 | Composite |
| FACULTY EVALUATORS | #1 | .380 | .406 | .673 | .571 | .466 | .772*** |
| | #2 | | .222 | .506 | .496 | .664 | .713 |
| | #3 | | | .338 | .182 | .359 | .517 |
| | #4 | | | | .642 | .610 | .834*** |
| | #5 | | | | | .556 | .754** |
| | #6 | | | | | | .814*** |
| | Composite | | | | | | |
| GRADES | | | | | | | |
| NLN TESTS | | | | | | | |
| MMPI | | | | | | | |

** significant beyond the .05 level of confidence

*** significant beyond the .01 level of confidence

Table 17 (cont'd)

Spearman rank-order correlations of various evaluations and scores of the Class of 1963

| | | GRADES | NLN TESTS | MMPI | IQ |
|---|---|---|---|---|---|
| FACULTY EVALUATORS | #1 | .712 | .681 | —.200 | .237 |
| | #2 | .477 | .234 | .046 | .214 |
| | #3 | .254 | .217 | —.134 | .113 |
| | #4 | .746** | .601 | —.074 | .413 |
| | #5 | .760** | .605 | —.041 | .344 |
| | #6 | .523 | .264 | .052 | .222 |
| | Composite | .783*** | .578 | —.077 | .270 |
| GRADES | | | .792*** | —.014 | .403 |
| NLN TESTS | | | | —.099 | .351 |
| MMPI | | | | | .016 |

** significant beyond the .05 level of confidence

*** significant beyond the .01 level of confidence

.113. Of the ten correlations which involve the MMPI, however, only three are positive, and these never exceed .052. Thus, it seems certain that the MMPI is measuring something which is not measured by the other tests or evaluations.

The acid test of the MMPI's predictive ability came when it was used to predict the performance of the Class of 1964. Before giving the results of that prediction, however, it seems appropriate to compare the judgment of the Class of 1963 arrived at by use of the MMPI with that submitted by the testing agency whose services are employed each year by the school.

This agency administers a battery of tests, which includes the California Test of Mental Maturity, achievement tests in chemistry, arithmetic, reading, spelling, and English, and the Washburne Social Adjustment Inventory. The California test is reported in three scores, representing IQ, scholastic aptitude, and non-verbal factors. The Washburne test is reported according to seven subscores, namely, accuracy of personal rating, happiness, social membership, sympathy, maturity of purpose, impulse-judgment, and self-control.

The agency provides the school with a profile of each candidate, showing his plotted decile scores, together with a brief evaluation of his strengths and weaknesses and a clear statement as to whether or not he is recommended for acceptance. The various categories used to evaluate a candidate number nine, namely, superior, excellent, very good, recommended, borderline, satisfactory, condi-

tional, questionable, and rejected.

Since it is unwieldy to have so many different categories in any statistical operation, the investigator lumped the first four of these categories together into a "favorable"category and the last four into an "unfavorable" category. By allowing the middle or "borderline" category to act as a "swing" category and by making two distinct calculations, it was possible to construct the contingency tables shown below and on page 76. A comparison of the chi-square values of this table with that which shows the discriminative power of the MMPI, when it is used as a measure of total adjustment (Table 13, page 67) seems to show that both procedures are

Table 18

Contingency table, showing first-year performance of the Class of 1963, compared with performance predicted by the testing agency

| First-year Performance | Judgment of the testing agency * | | Total |
|---|---|---|---|
| | Recommended | Not Recommended | |
| "Successful" | 34 | 5 | 39 |
| "Unsuccessful" | 9 | 8 | 17 |
| Total | 43 | 13 | 56 (#) |

$\chi^2 = 8.273$ $P < .01$

* "Borderline" category considered as "favorable"

\# One member of this class did not take the pre-selection tests. No reason for this is given in his record.

highly discriminative and that, at least with reference to the Class of 1963, there was little to choose between them.

Table 19

Contingency table, showing first-year performance of the Class of 1963, compared with performance predicted by testing agency (alternate method)

| First-year Performance | Judgment of the testing agency * | | Total |
|---|---|---|---|
| | Recommended | Not Recommended | |
| "Successful" | 33 | 6 | 39 |
| "Unsuccessful" | 7 | 10 | 17 |
| Total | 40 | 16 | 56 (#) |

$\chi^2 = 10.496$ $P < .01$

* "Borderline" category considered as "unfavorable"

\# One member of this class did not take the pre-selection tests. No reason for this is given in his record.

Before an attempt is made to predict the performance of the Class of 1964 from that of the Class of 1963, it is important to know whether or not these two classes are comparable, that is, whether or not it is reasonable to assume that they have been drawn from the same general population. This assumption was investigated by computing the means of the MMPI scales for each class (Cf. Table 4, page 52, and Table 20, page 77) and testing these for possibly significant differences. Table 21 (page 78) shows that these

Table 20

MMPI T scores for the Class of 1964 (N=46)

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 32* | 1.70 | 2.50 | 4.99 |
| L | 0 - 10* | 2.41 | 2.76 | 1.98 |
| | 36 - 70 | 44.50 | 45.54 | 6.63 |
| F | 1 - 9* | 3.14 | 3.61 | 1.99 |
| | 45 - 64 | 49.70 | 51.74 | 4.70 |
| K | 38 - 75 | 58.50 | 56.24 | 8.96 |
| Hs | 34 - 72 | 50.50 | 51.22 | 8.50 |
| D | 34 - 75 | 47.75 | 48.94 | 8.16 |
| Hy | 32 - 69 | 56.14 | 55.35 | 7.63 |
| Pd | 43 - 81 | 59.50 | 60.37 | 9.03 |
| Mf | 45 - 90 | 65.00 | 64.46 | 10.50 |
| Pa | 38 - 70 | 53.79 | 53.93 | 5.99 |
| Pt | 44 - 79 | 56.83 | 58.87 | 8.79 |
| Sc | 40 - 78 | 59.30 | 58.83 | 9.30 |
| Ma | 43 - 86 | 59.70 | 61.76 | 8.81 |
| Si | 35 - 68 | 45.90 | 47.17 | 8.05 |

Mean of means for 10 clinical scales: 56.09

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 21

t ratios, giving statistical significance of differences between MMPI scale means for the Class of 1963 and the Class of 1964

| Scale | t |
|---|---|
| L | 0.437 |
| F | 0.899 |
| K | —2.918 **** |
| Hs | —0.964 |
| D | —0.319 |
| Hy | —1.628 |
| Pd | —4.095 ***** |
| Mf | —4.630 ***** |
| Pa | —1.301 |
| Pt | —2.682 *** |
| Sc | —3.466 **** |
| Ma | —3.016 **** |
| Si | —1.024 |

— indicates difference in favor of better adjustment of the Class of 1963 over the Class of 1964

** significant beyond the .05 level of confidence

*** significant beyond the .02 level of confidence

**** significant beyond the .01 level of confidence

***** significant beyond the .001 level of confidence

classes do differ significantly on five of the ten clinical scales and on the K validity scale as well.

This K scale, as was mentioned in Chapter III (page 17), is a measure of "test-taking attitude, appearing either as personal defensiveness or as an exhibition of personal defects and troubles." When a group is being tested in an academic rather than a clinical setting, it seems that a high K score should not readily be ascribed to the personal defects and troubles of the students, but rather to aspects of the testing situation which they perhaps found threatening.

Along these lines it seems that an explanation for the high K score of the Class of 1964 can be found in the respective religious persuasions of the two classes. The investigator appeared before both classes, dressed in the street garb of a Roman Catholic priest. It seems plausible, therefore, that the Catholics among the students may have adopted a different attitude toward him than did those who were not Catholics. The non-Catholics might deliberately or indeliberately have attempted to appear in a more favorable light on a test conducted by a priest than on one conducted by a lay person, whereas the Catholic students may have been more than ordinarily candid in responding to a test conducted by a priest. Since there were many more non-Catholic students in the Class of 1964 than in the Class of 1963, their presence might explain the greater defensiveness of the Class of 1964, as indicated by their elevated K scale mean.

Be that as it may, the significant differences between these two classes on five of the clinical scales pose a different and much more serious problem. There is the possibility that the Class of 1963, which was chosen somewhat arbitrarily as the control or normative group for this study, is indeed far from typical. If this be true, it will necessitate a number of adjustments in the interpretation of the data. However, it is still too early to have formed an opinion as to what constitutes the "typical" male student nurse or the "typical" class.

The cut-off score used to distinguish well-adjusted members of the Class of 1963 from poorly-adjusted members of the class was a total T score of 564 (Cf. Table 12, page 66). This score was selected because it discriminated most effectively between those who were "successful" and those who were "unsuccessful." Since this score was chosen empirically, the question arose as to whether the same exact score should be used as the cut-off score for the Class of 1964 or whether some other score should be used.

The question was answered in this way. The Class of 1963 deviated from the theoretical mean of 50.00 set by the test authors, having an overall clinical-scale mean of 52.08. For this class the cut-off score of 564 was found useful. Since the Class of 1964 deviated even more widely from the theoretical mean, showing an overall clinical-scale mean of 56.09, it seemed reasonable that this class should have a higher cut-off score. Solving the implied proportion gave a value of 607.46; therefore, 607 was chosen as the

cut-off score for the Class of 1964.

It is time now to assess the predictive value of the MMPI. The school records show that 10 members of the Class of 1964 dropped out of school during the first year of training, while the rest of the class members are now in their second year of training at the school. Table 22 (page 82) lists all 46 members of the class by number, in the order of their "total adjustment," as measured by their total MMPI T scores.

It will be seen from this table that there is no such impressive clustering of drop-outs near the bottom of the table as there was with the Class of 1963 (Cf. Table 12, page 66). Chi-square analysis of the data (Cf. Table 23, page 83) shows that the likelihood of obtaining such results by chance is so great as to make it unreasonable to assign any statistical significance to them. In other words, the MMPI simply does not distinguish "successful" male student nurses from "unsuccessful" ones.

It will be remembered that earlier efforts to correlate the MMPI data of the Class of 1963 with the students' classroom grades, NLN test scores, and supervisors' ratings did not produce any significant results. In fact, it was this failure which led to the use of Bier's total adjustment score. Now that the total adjustment score itself has failed to distinguish "successful" students from "unsuccessful" ones, there seems little point in recurring to similar evaluations of the Class of 1964, as if one expected to find something significant in them. Nevertheless, for the sake of

## Table 22

Class of 1964, ranked according to total adjustment, that is, according to total MMPI T scores

| | | |
|---|---|---|
| 1 | 17 | 33 # |
| 2 | 18 # | 34 |
| 3 | 19 | 35 # |
| 4 | 20 | 36 # |
| 5 | 21 | 37 |
| 6 # | 22 | (607)———(607) |
| 7 | 23 # | 38 |
| 8 | 24 | 39 |
| 9 | 25 | 40 |
| 10 | 26 | 41 |
| 11 | 27 | 42 # |
| 12 | 28 # | 43 # |
| 13 # | 29 | 44 |
| 14 | 30 | 45 |
| 15 | 31 | 46 |
| 16 | 32 | |

# "unsuccessful" student; has discontinued training; is not eligible to return

All other students continue in training at this school of nursing.

Table 23

Contingency table, showing first-year performance of the Class of 1964, compared with performance predicted from their total MMPI T scores

| First-year Performance | According to total MMPI T scores | | Total |
|---|---|---|---|
| | Well-adjusted | Poorly-adjusted | |
| "Successful" | 29 | 7 | 36 |
| "Unsuccessful" | 8 | 2 | 10 |
| Total | 37 | 9 | 46 |

$\chi^2 = 0.001$ $P = .96$

completeness, the various correlations are given in Table 24.

The supervisors' evaluations need a word of explanation. During the summer of 1962 certain administrative changes in the school and hospital resulted in the assignment of faculty evaluators of the earlier group to new positions in which their contact with the student nurses was drastically curtailed. In September, 1962, when this investigator requested evaluations of the Class of 1964, four of the original evaluators were still available. A substitute was obtained for the fifth evaluator, but there was at hand no substitute for the sixth. Two courses of action were possible. The study could proceed with only five evaluations of the Class of 1964 instead of six, as there had been with the Class of 1963, or some new evaluator could be asked to undertake this task. Rather

Table 24

Spearman rank-order correlations of various evaluations and scores of the Class of 1964

| | | FACULTY EVALUATORS | | | | | GRADES | NLN TESTS |
|---|---|---|---|---|---|---|---|---|
| | | #2 | #3 | #4 | #5 | Composite | | |
| FACULTY EVALUATORS | #1 | .647 | .610 | .376 | .514 | .829*** | .374 | .243 |
| | #2 | | .675 | .199 | .604 | .809*** | .317 | .206 |
| | #3 | | | .173 | .488 | .710 | .448 | .088 |
| | #4 | | | | .440 | .584 | .394 | .322 |
| | #5 | | | | | .785*** | .429 | .192 |
| | Composite | | | | | | .487 | .264 |
| | GRADES | | | | | | | .394 |
| | NLN TESTS | | | | | | | |
| | MMPI | | | | | | | |
| TAT SCORERS | #1 | | | | | | | |
| | #2 | | | | | | | |
| | #3 | | | | | | | |
| | Composite | | | | | | | |

** significant beyond the .05 level of confidence
*** significant beyond the .01 level of confidence

Table 24 (cont'd)

Spearman rank-order correlations of various evaluations and scores of the Class of 1964

| | | MMPI | TAT SCORERS #1 | TAT SCORERS #2 | TAT SCORERS #3 | TAT SCORERS Composite | IQ |
|---|---|---|---|---|---|---|---|
| FACULTY EVALUATORS | #1 | .216 | —.020 | —.103 | —.049 | —.061 | —.132 |
| | #2 | .148 | .087 | —.186 | .036 | —.027 | —.003 |
| | #3 | .080 | .077 | .028 | .173 | .093 | —.048 |
| | #4 | .327 | .121 | —.036 | —.035 | —.004 | —.120 |
| | #5 | .428 | .192 | .097 | .160 | .089 | —.002 |
| | Composite | .317 | .088 | —.029 | .070 | .035 | —.064 |
| | GRADES | .036 | .148 | .351 | .377 | .301 | .095 |
| | NLN TESTS | .154 | .0003 | —.003 | .036 | .011 | .185 |
| | MMPI | | .215 | .065 | .063 | .104 | —.078 |
| TAT SCORERS | #1 | | | .477 | .571 | .729** | —.188 |
| | #2 | | | | .907*** | .893*** | .034 |
| | #3 | | | | | .946*** | .019 |
| | Composite | | | | | | —.065 |

** significant beyond the .05 level of confidence
*** significant beyond the .01 level of confidence

than introduce another source of possible contamination, the investigator decided to proceed with just five evaluators.

It will be noted in Table 24 (pages 84 and 85) that the highest correlation involving the IQ is .185 and that, in fact, most of the correlations involving the IQ are negative. From this it seems that the intelligence test which is part of the pre-selection battery measures a factor not prominent in any of the other tests and, for this reason, should be retained.

When the MMPI records of the 10 "most successful" members of the Class of 1964, as determined by faculty evaluation (Cf. Table 25, page 87) are compared with the MMPI records of the 10 "unsuccessful" members of the class (Cf. Table 26, page 88), it is apparent that the MMPI detects very little difference between these two groups. Table 27 (page 89) shows that the *t* ratios confirm the fact that the MMPI as a whole has not been found to distinguish between the "successful" and the "unsuccessful" students in the male nursing program.

For some reason the testing agency enjoyed no greater success in its predictions for the Class of 1964 than did this study. Table 28 (page 90) shows that the likelihood of arriving by chance at a prediction similar to that made by the testing agency is so great as to make these predictions of doubtful worth.

One of the advantages of the MMPI is the pool of items which it develops as a source of additional scales, some 213 of which

Table 25

MMPI T scores of the 10 "most successful" members of the Class of 1964, as determined by faculty evaluation

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 7* | 1.25 | 1.30 | 2.00 |
| L | 0 - 4* | 2.30 | 2.10 | 1.22 |
| | 36 - 50 | 42.50 | 43.40 | 4.15 |
| F | 2 - 3* | 2.50 | 2.50 | 0.50 |
| | 48 - 50 | 49.00 | 49.00 | 1.00 |
| K | 51 - 68 | 59.50 | 60.60 | 4.88 |
| Hs | 44 - 57 | 48.83 | 50.30 | 4.03 |
| D | 41 - 53 | 48.17 | 47.10 | 3.91 |
| Hy | 49 - 60 | 56.00 | 55.80 | 2.89 |
| Pd | 46 - 67 | 57.50 | 57.20 | 5.74 |
| Mf | 47 - 90 | 63.50 | 65.30 | 11.68 |
| Pa | 41 - 67 | 52.83 | 53.50 | 6.61 |
| Pt | 48 - 75 | 56.50 | 56.90 | 7.19 |
| Sc | 44 - 63 | 54.83 | 55.20 | 5.19 |
| Ma | 45 - 78 | 59.50 | 59.90 | 8.98 |
| Si | 37 - 68 | 42.83 | 45.60 | 9.18 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 26

MMPI T scores of "unsuccessful" members of the Class of 1964 (N=10)

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 8* | 1.67 | 2.10 | 2.59 |
| L | 1 - 10* | 3.10 | 4.10 | 2.62 |
| | 40 - 70 | 46.83 | 50.00 | 8.85 |
| F | 1 - 7* | 3.50 | 3.50 | 1.86 |
| | 46 - 60 | 49.50 | 51.60 | 4.36 |
| K | 44 - 75 | 58.17 | 57.50 | 10.21 |
| Hs | 44 - 72 | 52.50 | 54.00 | 8.94 |
| D | 44 - 63 | 50.17 | 51.70 | 5.48 |
| Hy | 44 - 67 | 58.83 | 58.20 | 7.32 |
| Pd | 50 - 71 | 62.83 | 62.40 | 5.37 |
| Mf | 53 - 78 | 58.50 | 62.10 | 7.91 |
| Pa | 47 - 62 | 53.50 | 55.10 | 2.76 |
| Pt | 48 - 75 | 56.50 | 58.90 | 8.53 |
| Sc | 46 - 73 | 63.50 | 61.30 | 9.18 |
| Ma | 43 - 73 | 61.50 | 60.80 | 9.42 |
| Si | 35 - 56 | 47.50 | 45.60 | 6.14 |

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 27

t ratios, giving statistical significance of differences between MMPI scale means of 10 "most successful" and 10 "unsuccessful" members of the Class of 1964

| Scale | t |
|---|---|
| L | —2.136 ** |
| F | —1.836 * |
| K | 0.866 |
| Hs | —1.193 |
| D | —2.161 ** |
| Hy | —0.965 |
| Pd | —2.092 * |
| Mf | 0.718 |
| Pa | —0.707 |
| Pt | —0.567 |
| Sc | —1.830 * |
| Ma | —0.219 |
| Si | 0.000 |

— indicates difference in favor of better adjustment of "most successful" members of the class over the "unsuccessful" members

* significant beyond the .10 level of confidence

** significant beyond the .05 level of confidence

Table 28

Contingency table, showing first-year performance of the Class of 1964, compared with performance predicted by testing agency

| First-year Performance | Judgment of the testing agency | | Total |
|---|---|---|---|
| | Recommended | Not Recommended | |
| "Successful" | 31 | 4 | 35 |
| "Unsuccessful" | 9 | 1 | 10 |
| Total | 40 | 5 | 45* |

$\chi^2 = 0.016$ $P > .90$

* One member of this class did not take the pre-selection tests. No reason for this is given in his school record.

have already been developed. In the thought that one or other of these scales might distinguish the "successful" student nurses from the "unsuccessful" ones, the investigator scored the MMPI records of the Class of 1964 according to several of these additional scales which seemed to enjoy a certain "face validity." The scales used were the Emotional Maturity (Em) scale, developed by Pearson (1954); the General Maladjustment (Gm) scale of Welsh (1952); the Inner Maladjustment (In) scale of Simon (1957); and the Choice of Nursing (Nc) scale of Beaver (1953). Table 29 summarizes the chi-square analyses of the performance of the Class of 1964 on each of these scales. It is seen from Table 29 (page 91) that the Gm scale is the only one which attains statistical significance and that

Table 29

Summary of chi-square analyses of first-year performance of the Class of 1964, compared with performance of same class on several additional scales of MMPI

| Scale | $\chi^2$ | P |
|---|---|---|
| Em (Pearson) | 0.527 | .478 |
| Gm (Welsh) | 3.239 | .076 |
| In (Simon) | 0.260 | .628 |
| Nc (Beaver) | 0.245 | .638 |

even this one is not significant at the .05 level of confidence. Thus, the use of the additional scales does not seem to have helped much in the problem of selection for nursing school.

There are a number of studies, though, which attest the value of using one or other of the ten conventional clinical scales in measuring certain traits or in assessing certain types of subjects. Gough (1947, 1950), for instance, suggested subtracting the raw score for the K scale from the raw score for the F scale, in order to detect subjects who are dissimulating. When MacLean, Tait, and Catterall (1953) applied this formula to female student nurses, they found (1) that F-minus-K scores of plus-1 or higher indicated that the student was either a malingerer or an unusually honest and self-critical person; (2) that scores from zero to minus-10 indicated that the student was normal; (3) that within the score range of minus-11 to minus-16 the student was to be considered "doubtful;"

Table 30

Distribution of F-minus-K scores of the Class of 1963

| F-minus-K score | "Successful" non-Brothers | "Successful" Brothers | "Unsuccessful" | Total |
|---|---|---|---|---|
| + 1 or higher | 3 | 0 | 0 | 3 |
| 0 to —10 | 12 | 2 | 14 | 28 |
| —11 to —16 | 12 | 6 | 2 | 20 |
| —17 or lower | 1 | 2 | 0 | 3 |
| Total | 28 | 10 | 16 | 54 |

and (4) that scores beyond minus-16 showed a desire to "fake good."

"Unsuccessful" members of the Class of 1963 (Cf. Table 30) show a discernible tendency toward a more positive F-minus-K index than do the "successful" students. In other words, the "unsuccessful" students tended more toward apparent malingering or "faking bad." This tendency is not apparent, however, in the records of the Class of 1964 (Cf. Table 31, page 93), which show the "unsuccessful" students evenly distributed over three F-minus-K categories. In fact, the only pattern which is apparent in these data is the tendency for those students who show a very strongly positive F-minus-K index to persevere in nurses' training, and this without exception. Since their continued good standing is proof that they are not malingerers and since there is no apparent reason why they should want to "fake bad," the conclusion seems to be that these

Table 31

Distribution of F-minus-K scores of the Class of 1964

| F-minus-K score | "Successful" non-Brothers | "Successful" Brothers | "Unsuccessful" | Total |
|---|---|---|---|---|
| + 1 or higher | 1 | 0 | 0 | 1 |
| 0 to —10 | 12 | 0 | 4 | 16 |
| —11 to —16 | 13 | 1 | 3 | 17 |
| —17 or lower | 8 | 1 | 3 | 12 |
| Total | 34 | 2 | 10 | 46 |

are highly self-critical individuals. Perhaps such a characteristic makes for success rather than failure in the discerning and careful profession of nursing.

It will be remembered that Altus (1948) claimed that the Ma scale distinguished academic achievers from non-achievers beyond the .01 level of confidence, with the non-achievers consistently scoring higher on this scale than did the achievers. When the Ma scale records of the Class of 1963 were studied, this scale was found to distinguish the successful students from the unsuccessful ones beyond the .02 level of confidence, but not at the .01 level. The Ma scale records of the Class of 1964 did not distinguish between the two groups of students within that class at any significant level whatever.

Wexner (1954) reported a positive correlation of Pa scale

scores with intelligence. His results, however, were not confirmed with either group used in this study. Correlations of —.07 and —.13 were obtained for the Class of 1963 and the Class of 1964, respectively.

Anderson (1956) reported a positive correlation of the Pa scale with academic achievement, but this result, too, was not confirmed by the present study. The correlations obtained were —.15 and —.10 for the Class of 1963 and the Class of 1964, respectively.

Yeomans and Lundin (1957) reported that the Pd, Mf, and Pa scales were all useful in discriminating within college-level groups. They showed that the better students scored higher on the Mf scale, while the poorer students scored higher on the Pd and Ma scales. These results were not confirmed with the subjects of this study, principally because all of them, "successful" and "unsuccessful" alike, scored high on all three scales.

A conspicuous number of the "unsuccessful" members of both classes fit Drake and Oetting's (1957) pattern—Sc and Ma among the three highest scales; Mf not among the three highest; Si among the two lowest—and are, therefore, suspect of lacking academic motivation. Chi-square analysis of these data (Cf. Table 32, page 95) shows that it is reasonable to expect that those who fit the Drake-Oetting pattern will eventually be numbered among the "unsuccessful" students.

By the time the study had reached this point, the Class of

Table 32

Summary of chi-square analyses of the Class of 1963 and the Class of 1964, compared according to Drake-Oetting pattern

| Group | $\chi^2$ | P |
|---|---|---|
| Class of 1963 | 4.408 | .039 |
| Class of 1964 | 2.164 | .151 |

1965 had already been selected and had begun training at the school. This investigator gave them the MMPI during their first week of training. Since the school officials furnished all the usual background information, as they had for the other two classes, it was possible to compare the Class of 1965 with each of the two classes which had preceded it. Such a comparison may help to indicate which of the two preceding classes is more nearly "typical" of this school; however, further work along these lines will still be needed.

There were 49 men in the entering Class of 1965. They came from 14 different States in this country and from one Province of Canada. Thirty-eight of them (nearly 78% of the total) were residents of the seven midwestern States of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. Seven men had previously served in the armed forces—three in the army, two in the air force, one in the navy, and one in the national guard. Thirteen men (about 27% of the total) had done some previous college work.

Table 33

Certain Characteristics of the Class of 1965 (N=49)

| | Range | Mdn | M | SD |
|---|---|---|---|---|
| Age (in years) | 17.75 - 40.33 | 19.54 | 20.88 | 3.83 |
| IQ* | 97 - 154 | 120.70 | 120.79 | 11.69 |
| Siblings: | | | | |
| Brothers | 0 - 6 | 1.48 | 1.55 | 1.67 |
| Sisters | 0 - 4 | 1.38 | 1.23 | 1.08 |

* as measured by the California Test of Mental Maturity

Twenty-one men had worked as orderlies or technicians, of whom three had also served as hospital corpsmen during military service.

Thirty-seven men (about 75% of the total) were Roman Catholics. Among the others there were three Methodists, two Lutherans, one Baptist, one Congregationalist, one Presbyterian, and four undifferentiated "Protestants." Seven members of the class were religious Brothers; the rest were secular students. One entering student was married; all the rest were single. Other characteristics of this class are given in Table 33 above.

A comparison of the MMPI scale means for this class (Cf. Table 34, page 97) with those for the Classes of 1963 (Cf. Table 4, page 52) and 1964 (Cf. Table 20, page 77) shows that the Class of 1965 bears a strong resemblance to the Class of 1964 but differs from the Class of 1963 even more significantly than does the Class of

Table 34

MMPI T scores for the Class of 1965 (N=49)

| Scale | Range | Mdn | M | SD |
|---|---|---|---|---|
| ? | 0 - 30* | 2.30 | 4.61 | 6.30 |
| L | 0 - 7* | 2.79 | 2.90 | 1.73 |
| | 36 - 60 | 45.83 | 46.00 | 5.74 |
| F | 0 - 18* | 3.05 | 4.04 | 3.77 |
| | 44 - 85 | 50.38 | 52.78 | 5.47 |
| K | 33 - 74 | 55.00 | 55.22 | 9.52 |
| Hs | 36 - 80 | 52.33 | 51.98 | 9.03 |
| D | 32 - 82 | 52.21 | 54.57 | 10.18 |
| Hy | 45 - 80 | 59.00 | 58.04 | 7.42 |
| Pd | 46 - 95 | 60.50 | 61.35 | 9.60 |
| Mf | 45 - 90 | 64.21 | 64.57 | 10.74 |
| Pa | 35 - 79 | 53.07 | 54.14 | 8.65 |
| Pt | 35 - 87 | 62.25 | 61.88 | 10.97 |
| Sc | 40 - 92 | 61.17 | 61.76 | 11.33 |
| Ma | 38 - 86 | 59.36 | 60.35 | 13.82 |
| Si | 30 - 72 | 50.33 | 50.63 | 10.01 |

Mean of means for clinical scales: 57.93

* Raw scores. T scores are not used on the ? scale when the number of "cannot say" responses is fewer than 30. Current research favors reporting the L and F scales in raw scores rather than in T scores. Both scores are given for these scales.

Table 35

t ratios, giving statistical significance of the differences between MMPI scale means of the Class of 1963 and the Class of 1965

| Scale | t |
|---|---|
| L | 0.106 |
| F | —0.076 |
| K | —2.264 ** |
| Hs | —1.389 |
| D | —3.113 **** |
| Hy | —3.636 ***** |
| Pd | —4.576 ***** |
| Mf | —4.719 ***** |
| Pa | —1.200 |
| Pt | —3.864 ***** |
| Sc | —4.623 ***** |
| Ma | —1.749 * |
| Si | —2.846 **** |

— indicates difference in favor of better adjustment of the Class of 1963 over the Class of 1965

* significant beyond the .10 level of confidence
** significant beyond the .05 level of confidence
*** significant beyond the .02 level of confidence
**** significant beyond the .01 level of confidence
***** significant beyond the .001 level of confidence

1964. The *t* ratios, indicating the statistical significance of these differences are given in Tables 21 (page 78), 35 (page 98), and 36 (page 100).

It was learned at this time that another six members of the Class of 1963 dropped out of the school during their second year of training. Four of these are not eligible to return. Thus, as this is written, there are only 30 remaining members of the Class of 1963, which originally numbered 59. Eight of the drop-outs are eligible to return, but that still leaves 21 men, more than one-third of the original number, who must clearly be considered "unsuccessful." This severe rate of attrition was not usual in the classes which preceded the Class of 1963, nor does it seem likely for the Class of 1964. Consideration of all the evidence which has been gathered, the clear indications and the hints as well, leads to the conclusion that the Class of 1963 is not characteristic of this school. Hence, predictions of other classes, based on the performance of the Class of 1963, were virtually foredoomed to failure.

The present evidence shows that the "typical" successful student at this school scores well above the MMPI normative group on most of the clinical scales. Peaks on the *Pd*, *Mf*, *Pt*, and *Ma* scales should not be considered indicative of maladjustment in the absence of other evidence. However, unusually high scores on the *Pd* and *Ma* scales, unaccompanied by a high *Mf* score, have been characteristic of many of the school's drop-outs. The pattern which

Table 36

t ratios, giving statistical significance of the differences between MMPI scale means of the Class of 1964 and the Class of 1965

| Scale | t |
|---|---|
| L | —1.817 * |
| F | —0.346 |
| K | —0.992 |
| Hs | —0.423 |
| D | —2.984 **** |
| Hy | —1.741 * |
| Pd | —0.511 |
| Mf | —0.051 |
| Pa | —0.140 |
| Pt | —1.479 |
| Sc | —1.379 |
| Ma | 0.598 |
| Si | —1.864 * |

— indicates difference in favor of better adjustment of the Class of 1964 over the Class of 1965

* significant beyond the .10 level of confidence

**** significant beyond the .01 level of confidence

Drake and Oetting (1957) found characteristic of those who lack academic motivation is also characteristic of this school's drop-outs.

Neither age nor IQ is consistently correlated with success in the school. Older students were more conspicuous among the "successful" members of the Class of 1963, but with the Class of 1964 it was the older students who tended to drop out. More important than mere age seems to be the consideration of what the man has done since leaving high school. Where the intervening years have been spent in military service, the prognosis for success in school is not encouraging, especially if the years of military service did not involve work in a medical auxiliary function.

Where no other information is available, the IQ can be used as the basis of selection with reasonable success. This is what would be expected from the whole history of nursing-school selection. However, the weight of this study should be added to those which counsel the use of other selective procedures, while retaining the intelligence test.

## CHAPTER VII

## RESULTS: THE THEMATIC APPERCEPTION TEST

Each member of the Class of 1964 took the TAT sometime during the month of September, 1961, his first month of nurses' training. The tests were self-administered, each student working in his own room at the nursing school residence and writing his stories in longhand. Thirteen cards of the standard set were used, namely, Cards 1, 2, 3BM, 4, 6BM, 7BM, 10, 11, 13MF, 14, 16, 17BM, and 20.

The investigator worked from the handwritten stories, making an import for each story and scoring these according to Arnold's system, as explained in Chapter IV of this paper. He used the import categories and the 4-3-2-1 scoring system which were current in 1960, when he himself was trained in the method of sequential analysis. He also prepared typewritten copies of each subject's stories, an original and two carbon copies of each typewritten protocol. All identifying details were deleted from these sheets, the subjects' names being replaced by code numbers. In all other respects, however, the original stories were transcribed as accurately as possible. Errors in spelling, punctuation, and diction were transcribed as the subjects had written them. Occasionally an emended form was supplied in brackets where it was deemed necessary for the sense of the sentence.

Two additional scorers were selected by one of the readers of this study, but their identity was not revealed to the investigator. Each of these scorers was given a full set of the subjects' typewritten stories and asked to score them according to Arnold's method of sequence analysis. In due time each scorer indirectly returned to the investigator a tally sheet, showing each subject's code number and the scores which the scorer had assigned to each of his stories. Since both scorers had been trained by Arnold in the method of sequence analysis during the year 1961, they used the revised list of import categories and the revised scoring system (Cf. page 39) which were in use at that time.

The investigator converted these scores into the 4-3-2-1 system which Fagot (1962) has shown to be equivalent to the other system. He totaled the scores assigned to each subject's stories, assigning each subject a rank on the basis of the total score. Tables 37, 38, and 39 (pages 104, 105, and 106) list the subjects by number, ranked in accordance with these total TAT scores.

Arnold uses the neutral zero point on the plus-2, plus-1, minus-1, minus-2 scale or the 2.50 point on the 4-3-2-1 scale to mark the division between a "good" or positive protocol and a "bad" or negative one. A protocol with a mean score of 2.50 for 13 stories would have a total score of 32.50. For this reason a total score of 32 was used as the cut-off score between "good" and "bad" protocols, and a line was drawn at the appropriate places on Tables 37, 38, and 39 (pages 104, 105, and 106). These lines are labeled

Table 37

Class of 1964, ranked according to TAT protocols, as scored by Scorer #1

| | | |
|---|---|---|
| 1 | 17 | 32 |
| 2 | 18 | 33 |
| 3 | 19 | 34 # |
| 4 | 20 | 35 |
| 5 # | 21 | ——————(Ad hoc) |
| 6 | 22 | 36 # |
| 7 | 23 | 37 |
| 8 # | 24 | 38 # |
| 9 | 25 | 39 |
| 10 # | 26 # | 40 |
| 11 | 27 | 41 |
| 12 | 28 # | 42 |
| 13 # | ——————(Arnold) | 43 |
| 14 | 29 | 44 |
| 15 | 30 | 45 |
| 16 | 31 # | 46 |

# indicates students who have discontinued training during the first year. All other students continue training at the same school of nursing.

Table 38

Class of 1964, ranked according to TAT protocols, as scored by Scorer #2

| | | |
|---|---|---|
| 1 | 16 | 32 |
| 2 | ——————(Arnold) | 33 |
| 3 | 17 | 34 |
| 4 # | 18 | 35 |
| 5 | 19 | 36 |
| 6 | 20 | 37 |
| 7 | 21 | 38 |
| 8 | 22 # | 39 |
| 9 # | 23 # | ——————(Ad hoc) |
| 10 | 24 | 40 # |
| 11 | 25 | 41 # |
| 12 | 26 | 42 |
| 13 # | 27 | 43 |
| 14 | 28 | 44 |
| 15 | 29 # | 45 # |
| | 30 | 46 |
| | 31 # | |

# indicates students who have discontinued training during the first year. All other students continue in training at the same school of nursing.

Table 39

Class of 1964, ranked according to TAT protocols, as scored by Scorer #3

| | | |
|---|---|---|
| 1 | 17 | 32 |
| 2 | 18 | 33 |
| 3 | 19 | 34 # |
| 4 | 20 | 35 |
| 5 | ——————(Arnold) | 36 |
| 6 # | 21 | ——————(Ad hoc) |
| 7 | 22 | 37 # |
| 8 | 23 | 38 # |
| 9 | 24 # | 39 |
| 10 | 25 | 40 |
| 11 # | 26 | 41 |
| 12 # | 27 # | 42 |
| 13 | 28 | 43 |
| 14 | 29 | 44 |
| 15 | 30 # | 45 |
| 16 | 31 | 46 # |

# indicates students who have discontinued training during the first year. All other students continue in training at the same school of nursing.

"Arnold," since they have been drawn at the spots suggested by the Arnold scoring system. Inspection of Tables 37, 38, and 39 (pages 104, 105, and 106) shows that several "unsuccessful" students have scores above this line and that a large number of "successful" students are ranked below it. In other words, when the Arnold cut-off scores are used for the TAT protocols scored according to her system, they do not distinguish "successful" student nurses from "unsuccessful" ones. Chi-square analysis of the data obtained by using these cut-off scores confirms this visual impression (Cf. Table 40) and shows that it is entirely possible for results such as these to be obtained by chance.

Table 40

Summary of chi-square analyses, showing discrimination of the Class of 1964 by the TAT, using various scorers and various cut-off scores

| Scorer | Cut-off score | $\chi^2$ | P |
|---|---|---|---|
| #1 | Arnold | 0.004 | .949 |
| #1 | Ad hoc | 0.108 | .749 |
| #2 | Arnold | 0.129 | .725 |
| #2 | Ad hoc | 2.170 | .150 |
| #3 | Arnold | 0.945 | .341 |
| #3 | Ad hoc | 0.513 | .483 |

It was thought that perhaps some sort of empirical or ad hoc

cut-off score could be chosen which would lead to significant results. Admittedly it would be hard to justify this procedure and replication in future experiments would be difficult, but it was thought that such a score should be chosen and investigated for its significance. The score chosen varied with the rankings assigned by each scorer, since it was placed at the most advantageous spot in each scorer's set of ranks. These scores are shown in Tables 37, 38, and 39 (pages 104, 105, and 106). The chi-square analyses which resulted from their use are summarized in Table 40 (page 107). There it is seen that the empirical cut-off score chosen for use with Scorer #2's evaluations is significant at the .15 level of confidence, but that none of the other results is significant even at this level.

Table 24 (pages 84 and 85) shows that there was considerable variance among the three TAT scorers, especially between the investigator (Scorer #1) and the other two scorers. There are several possible explanations for this. First, the investigator learned Arnold's system in 1960 and in his scoring made use of the import categories and the 4-3-2-1 scoring system in vogue at that time. The other scorers learned Arnold's system in 1961 and in doing their scoring used the expanded list of import categories and the plus-2, plus-1, minus-1, minus-2 scoring system in use at that time. It does not appear that the difference in the scoring systems should introduce any discrepancies, especially since Fagot (1962) reported that the two systems were equivalent and interchangeable. However,

the 1961 list of import categories is much more detailed than the lists which it replaced and thus might be expected to give greater precision in the scoring.

Second, the investigator met each of the subjects personally at the time that he gave them the materials for the TAT. It was unavoidable that he form some sort of impression of them. When he scored their protocols, he worked from the handwritten sheets which contained the subject's true names. In this way his first impression was able perhaps to exert an indeterminate influence upon his evaluation of the stories. The other scorers did not meet the students personally; moreover, they worked from the anonymous typewritten sheets on which the subjects were identified only by code number.

Since there were these differences among the scorers, it was decided to combine their ratings in all possible ways and to see whether any of these combinations produced significant results. Empirical cut-off scores were introduced at the most advantageous locations and the data submitted to chi-square analysis. The results are summarized in Table 41 (page 110). It is seen there that the likelihood of achieving these results by chance ranges from .20 to .83, with none of the results attaining statistical significance.

The conclusion, therefore, seems to be that the TAT, when scored according to Arnold's method of sequential analysis, does not distinguish "successful" male student nurses from "unsuccessful" ones. Moreover, the large scorer variance raises questions

Table 41

Summary of chi-square analyses, showing discrimination of the Class of 1964 by the TAT, using various combinations of scorers and cut-off scores

| Scorer combination | $\chi^2$ | P |
|---|---|---|
| #1 and #2 (a) | 0.221 | .655 |
| #1 and #2 (b) | 0.051 | .827 |
| #1 and #3 (a) | 0.511 | .484 |
| #1 and #3 (b) | 0.552 | .471 |
| #2 and #3 (a) | 1.060 | .303 |
| #2 and #3 (b) | 1.627 | .202 |
| #1, #2, and #3 (a) | 0.634 | .443 |
| #1, #2, and #3 (b) | 0.101 | .756 |
| #1, #2, and #3 (c) | 0.254 | .633 |

about the objectivity, validity, and reliability of this scoring system.

Undoubtedly, further experiments are needed in order to determine whether or not the revised list of import categories which Arnold introduced on an experimental basis in 1961 and published in her manual (1962) bring to her scoring system the objectivity and reliability which she has been seeking. The .907 coefficient posted in this study by the two scorers who used the revised list of categories gives reason to hope that the scoring system may be vindicated by further research.

However, it has not been the purpose of this study to test the scoring system but rather to investigate its usefulness in distinguishing "successful" male student nurses from "unsuccessful" ones. In this respect the results of this study have been negative, for, regardless of what combination of scorers was used, the TAT did not distinguish between these two groups of students. It is true, of course, that the reliability of the scoring system affects the validity of the test as a discriminating instrument. Thus, improved reliability may be expected to lead to improved validity. Within the limits of the scoring system as it exists at present, however, the TAT was not found to be a valid discriminating instrument.

There is no doubt that the large number of stories assembled as the result of this study—13 stories from each of 46 students—constitute a valuable pool for further TAT research. Doubtless, too, each subject's stories are susceptible of valuable clinical interpretation according to one or several of the various methods outlined in Chapter IV of this study. However, the original plan of this study was to use only Arnold's method of sequential analysis in interpreting the TAT protocols, so as to determine whether or not the TAT, scored and interpreted in this fashion, would function as a useful discriminating instrument in nursing-school selection. One of the reasons for choosing so restricted a goal was that many of the other interpretive procedures require a degree of training and test sophistication which it would be difficult for the administrators of this school to acquire. Thus, howsoever val-

uable some of these other methods might be from the standpoint of pure research, they were not judged to be practical for the use to which the TAT might actually be put in this school.

Only the Arnold method of sequential analysis has been used in this study, therefore. Within the limits of the import and scoring system as it exists at present, this analysis of the TAT has not been found successfully to distinguish "successful" male student nurses from "unsuccessful" ones.

# CHAPTER VIII

## SUMMARY AND CONCLUSIONS

The MMPI was administered to a group of entering students at a school for male nurses during the first week of their training. One year later the MMPI profiles of this group were studied in the light of their first-year performance, to ascertain what indications, if any, the MMPI had given ahead of time of their performance during that year. The same test was given to the next class of entering students, also during the first week of training, and their first-year performance was predicted on the basis of the MMPI characteristics learned from studying the first group. The second class was also given the TAT, self-administered and scored according to Arnold's method of sequential analysis. The MMPI and the TAT were compared for their efficiency in predicting success in nurses' training.

The results were as follows:

1. The MMPI, as a whole, did not distinguish successful male student nurses from unsuccessful ones.

2. The Drake-Oetting MMPI pattern, which reportedly identifies those who lack academic motivation, distinguished successful students from unsuccessful ones at the .15 level of confidence.

3. Welsh's MMPI scale of general maladjustment (Gm) distinguished successful students from unsuccessful ones beyond the .10 level of confidence.

4. Student nurses score higher than the normative group on most of the MMPI scales, especially on the Pd and Ma scales.

5. Successful student nurses also tend to score high on the Mf scale.

6. The TAT, scored according to Arnold's method of sequential analysis, did not distinguish successful student nurses from unsuccessful ones. However, it may prove clinically useful in counseling unsuccessful or problem students.

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## APPROVAL SHEET

The dissertation submitted by Reverend Glenn Francis Williams, S.J. has been read and approved by five members of the Department of Psychology.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the dissertation is now given final approval with reference to content, form, and mechanical accuracy.

The dissertation is therefore accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

January 4, 1963
Date

Thomas J. Feeney
Signature of Adviser